HARYANA STATE POLLUTION CONTROL BOARD
C-11, SECTOR-6, PANCHKULA
Ph-0172-577870-73, Fax No. 2581201

No. HSPCB/2022 **Dated:**

To

The Secretary,
Ministry of Environment, Forest and Climate Change,
Impact Assessment Division,
Jog Bagh Road, Aliganj,
New Delhi- 110003

Subject: Proceeding of the public hearing Conducted for the porposed construction of 6 lane greenfield connectivity from DND Faridabad Ballabgarh bypass from km 32+600 to jewar international airport under Bharatmala Pariyojana (Lot-4/pkg-1) in the state of Haryana and uttar pradesh total length 31.060 km Total Proposed length under faridabad district approx 19.070 km proposed by M/s National highway authority of india Ministry of Road Transport & Highways on 28.04.2022 at 10.00 Am in the kisan mandi in front of Mohna Tehsil office, District Faridabad Haryana.

Kindly refer to the subject noted above.

In this connection, I have been directed to enclosed herewith the proceeding of public hearing **(in original)** conducted on 28.04.2022 at 10:A.M at the project site under Environment Impact Assessment Notification dated 14.09.2006 for proposed construction of 6 lane greenfield connectivity from DND Faridabad Ballabgarh bypass from km 32+600 to jewar international airport under Bharatmala Pariyojana (Lot-4/pkg-1) in the state of Haryana and Uttar Pradesh total length 31.060 km Total Proposed length under faridabad district approx 19.070 km proposed by M/s National highway authority of india Ministry of Road Transport & Highways on 28.04.2022 at 10.00 Am in the Kisan Mandi in front of Mohna Tehsil office, District Faridabad Haryana alongwith CD of video recording photographs and attendance sheet etc. for information and further necessary action please.

Sr. Env. Engineer (HQ)
For Member Secretary

Endst No. HSPCB/2022/1231-1233 **Dated:-** 29.06.2022

A copy of above is forwarded to the following for information and further necessary action:-

1. Sr. EE (IT) HSPCB, for uploading the proceeding on website of the Board.
2. Regional Officer, Ballabgarh Region w.r.t. his letter dated No. 486 dated 30.05.2022 for information and further necessary action.
3. M/s National highway authority of Inida, Ministry of Road Transport & Highway

Sr. Env. Engineer (HQ)
For Member Secretary

HARYANA STATE POLLUTION CONTROL BOARD

Ballabgarh Region, Opp. Hewo Appmt., Sector-16A, Faridabad Website: www.hspcb.gov.in

NO. HSPCB/BR/2022 486 Dated: 30/5/22

To

The Chairman,
Haryana State Pollution Control Board,
Panchkula.

Sub: **Proceeding of the Public Hearing conducted for the proposed construction of 6 lane Greenfield connectivity from DND – Faridabad – Ballabgarh Bypass (from km 32+600) to Jewar International Airport under Bharatmala Pariyojana (lot-4/pkg-1) in the state of Haryana and Uttar Pradesh total length – 31.060 km total proposed length under Faridabad district approx 19.070 km, proposed by M/s National Highway Authority of India (Ministry of Road Transport & Highways) on 28.04.2022 at 10:00 am in the Kisan Mandi in front of Mohna Tehsil Office, District Faridabad, Haryana.**

In this connection, please find enclosed herewith the proceeding of public hearing held on 28.04.2022 at 10:00 AM of M/s National Highway Authority of India (Ministry of Road Transport & Highways) in original duly signed by the Deputy Commissioner, Faridabad along with the following documents:-

Sr. No.	Particular	Quantity
1.	Proceeding of Public Hearing	One number in original duly signed by Deputy Commissioner, Faridabad & Regional Officer, HSPCB, Ballabgarh Region.
2.	Photographs & Videos of Public Hearing	One No. of CD
3.	Attendance register of Public Hearing	One number in original (including officers attendance general public attendance)
4.	Copy of project report	One number

It is submitted for you information & further necessary action please.

DA/ as above

Signed by Regional Officer
Ballabgarh Region
Date: 30-05-2022 16:56:13
Reason: Approved


C. D. MAILER
HANDLE WITH CARE
To
(NHAI)
From
Mkt. By

2070062/2022/Estt.Br

PROCEEDING OF THE PUBLIC HEARING CONDUCTED FOR THE PROPOSED CONSTRUCTION OF 6 LANE GREENFIELD CONNECTIVITY FROM DND – FARIDABAD – BALLABGARH BYPASS (FROM KM 32+600) TO JEWAR INTERNATIONAL AIRPORT UNDER BHARATMALA PARIYOJANA (LOT-4/PKG-1) IN THE STATE OF HARYANA AND UTTAR PRADESH TOTAL LENGTH – 31.060 KM TOTAL PROPOSED LENGTH UNDER FARIDABAD DISTRICT APPROX 19.070 KM, PROPOSED BY M/S NATIONAL HIGHWAY AUTHORITY OF INDIA (MINISTRY OF ROAD TRANSPORT & HIGHWAYS) ON 28.04.2022 AT 10:00 AM IN THE KISAN MANDI IN FRONT OF MOHNA TEHSIL OFFICE, DISTRICT FARIDABAD, HARYANA.

VENUE: Kisan Mandi in front of Mohna Tehsil Office, District Faridabad, Haryana.

Date & Time: 28.04.2022 at 10.00 AM.

The following officers were present during the public hearing:-

1. Sh. Jitendar Yadav : Deputy Commissioner, Faridabad
2. Sh. Dinesh Kumar : Regional Officer, Ballabgarh Region, Haryana State Pollution Control Board
3. Sh. Bijender Singh Rana : DRO, Faridabad
4. Sh. Ujjwal Kumar : AEE, Regional Office, Ballabgarh Region, Haryana State Pollution Control Board
5. Sh. Ajay Kumar : Tehsildar, Mohna, Faridabad

The following Project representatives are also present during the Public Hearing:-

1. Sh. Dheeraj Singh : DGM, NHAI CMU Mathura.
2. Sh. Devendar Kumar : Site Engineer, NHAI CMU, Mathura
3. Sh. Rajesh Kumar Vishwa : M/s P.M. Solution Consulting Pvt. Ltd.
4. Sh. Sundarman Pandey : DPR Consultant, Noida,
5. Dr. R.S.Gangwar : Environment Specialist DPR Consultant SA Infra Noida

Public attended – 56 Nos. (List of Attendees enclosed)

At the outset the Regional Officer, Haryana State Pollution Control Board, Ballabgarh welcomed the Deputy Commissioner, Faridabad, District Revenue

Officer, Faridabad, Tehsildar, Sarpanch, Panch, Nambardar, other Officials & Public and the purpose of the public hearing to be conducted for the project.

After that, Mr. Rajesh Kumar Vishwa M/s P.M. Solution Consulting Pvt. Ltd., explained the project and the proposed environmental management plans through a powerpoint presentation on behalf of National Highway Authority of India for the proposed project of development of construction of 6 lane greenfield connectivity from DND – Faridabad – Ballabgarh bypass (From km 32+600) to Jewar International Airport under Bharatmala Pariyojana (Lot-4/Pkg-1) in the State of Haryana and Uttar Pradesh which has a total proposed Length of 31.060 KM and out of which approx. 19.070 km is under Faridabad District

Followed by the presentation, the public consultation was started.

The questions and reply given by NHAI / District Administrative along with proceeding of the public hearing will be sent to the concerned authority.

Details of comments/suggestions/objections/ views/ ideas raised during public hearing are enclosed as **Annexure-A.** Copy of CD containing Video recorded during Public Hearing are enclosed for reference as **Annexure-B.** The attendance of officers present from various departments and residents of nearby villages given as per **Annexure-C.**

At the end few residents showed resentment and walked away without signing the attendance register though they were attending the public hearing as evident from the Videography.

The public hearing ended with a vote of thanks to the Chair and general public for attending the public hearing.

Regional Officer,
HSPCB, Ballabgarh Region

Deputy Commissioner,
Faridabad

Annexure-A

Public Hearing was conducted on 28th April 2022, at 10:00AM in Kisaan Mandi in front of Mohna Tehsil Office District Faridabad, Haryana.

Sr.no	Questions in English	Answer in English
1	**Name: Mr. Hariprashad Singh S/o: Sh. Maan Singh, Village: Hirapur**	
	The Farmers had a complaint with the market that they didn't get the right price.	Dr. RS Gangwar Environment Specialist DPR Consultant SA Infra Noida has said that please ask questions related to road and environment.
	That farmer is left with nothing after acquisition of land, will he get compensation or not?	Dr. R.S.Gangwar Environment Specialist DPR Consultant SA Infra Noida explained that the Compensation will be given for whatever land that has been acquired and the remaining land belongs to the farmer.
	The expressway needs to be cut to get down from Mohana.	Dr. R.S.Gangwar Environment Specialist DPR Consultant SA Infra Noida explained that it is not possible to give access everywhere along the proposed alignment of Road.
2	**Name: Mr. Prem Chand S/o: Sh. Ram, Village: Panhera Khurd**	
	The land has not been divided; we are plowing the field for 80 years, who will get its compensation and how to tell.	The Deputy Commissioner, Faridabad Sh. Jitendar Yadav explained that all the land owners of the acquired land will get compensation and requested them to ask only environment related questions.
	Compensation should be given for the entire land and no one listens to our complaints	The Deputy Commissioner, Faridabad Sh. Jitendar Yadav submitted that all their issues will be resolved within 3 weeks, everyone whose land is acquired

		will get their due compensation.
	The expressway needs to have direct access from Mohana.	The Deputy Commissioner, Faridabad Sh. Jitendar Yadav submitted that this road has been constructed to reach Jewar Airport and earlier there was not even a single access point in it but now we have been able to convince them to give access to this road by suggesting that you will all reach Jewar airport within 15 minutes. Further it is not possible to get access points everywhere in such expressways.
3	**Name: Mr. D.K.Sharma S/o: Sh. Dayalal Sharma, Village: Panhera Khurd**	
	What will be the height of the expressway, how much will it be above the ground level, whether there will be a cut from the sub-village or not to go on the road?	Dr. R.S.Gangwar Environment Specialist DPR Consultant SA Infra Noida explained that it is not possible to give access everywhere along the proposed alignment of expressway and it will not be completely closed. Due to the high speed limit on the expressway, NHAI has designed it at some height from the ground level.
	20 villages come; all the villages need to be cut to go on the road.	The Deputy Commissioner, Faridabad Sh. Jitendar Yadav explained that it is not possible to give access everywhere along the proposed alignment of expressway.
	If Forest area is used then Wild animals will come to our farms, so as much as possible, the least possible forest area should be used while constructing the expressway.	Dr. R.S.Gangwar Environment Specialist DPR Consultant SA Infra Noida explained that this proposed expressway road is not passing through any wildlife sanctuary and only Protected forest that is coming along the

		alignment is on the side of canal road measuring 4 ha.
	Herbal plantation should be done on the median while fruit trees should be planted on the sides of the road.	The Deputy Commissioner, Faridabad Sh. Jitendar Yadav submitted that herbal and fruit plants will be planted in the median and the sides of this road. Further he advised that Bel trees may also be planted on the side of this road for its juice. He also emphasized on the importance of trees which were planted by our ancestors like Neem, Peepal trees etc whose benefits we are reaping today.
	There is no implementation of anything that is discussed in these meetings.	Dr. R.S.Gangwar Environment Specialist DPR Consultant SA Infra Noida submitted everything being pledged here will be implemented and the same will also be written in the Minutes of this Meeting.
	There should be a display board on the road side with contact numbers for complaints and for calling in case of an accident.	The Deputy Commissioner, Faridabad Sh. Jitendar Yadav also agreed with them and submitted that yes, there should be a display board with the contact number of concerned persons in case of accidents and for complaints during construction phase by NHAI.
	The field is being acquired, the circle rate is not growing, the rest of the villages have increased by 200%, ours has not increased, one road should get one rate, when will the compensation be received.	The Regional Officer, Ballabgarh HSPCB Sh. Dinesh kumar requested them to ask environment related question only and everyone will get money according to circle rates for rural and urban area
	Will farmers get 4 times the compensation or not?	The Deputy Commissioner, Faridabad Sh. Jitendar Yadav explained that everyone will get

Yadav

		money according to circle rates for rural and urban area
	Instead of circle rate, market rate should be given, why less or more. Since this is one Road so there should be one rate for all.	The Deputy Commissioner, Faridabad Sh. Jitendar Yadav explained that the rate of all lands is not the same so compensation is given according to the circle rates for that particular land only.
	Compensation should be given under the Haryana Act 2013. Possession only after compensation.	The Deputy Commissioner, Faridabad Sh. Jitendar Yadav explained that circle rate is decided based on the registry rate of the last 1 - 3 years and the act will be followed before buying of land and there will be no injustice to anyone.
4	**Name: Mr. Ishwar Singh S/o: Sh. Hridey Ram Singh** **Village: Mohna**	
	Farmers have not yet received the money for KLP Road, tell how long will he get the money, stop harassing the farmers.	The DGM, NHAI CMU Mathura Sh. Dheeraj singh explained that it does not come under us but under the second PIU but still NHAI will see to it and NHAI does not want to disturb any farmer
	The expressway needs to be cut to get down from Mohana for direct access.	The DGM, NHAI CMU Mathura Sh. Dheeraj singh has explained that it is not possible to give access everywhere along the proposed Expressway.
5	**Name: Mr. Surendra Singh S/o: Sh. Kirorimal Singh** **Village: Mohna**	
	Farmers never receive the money; he should take money first and then give the land.	The DGM, NHAI CMU Mathura Sh. Dheeraj singh explained that before taking the land for the proposed expressway, the due compensation will be given to the farmers.
	Framers have filed court cases which have cost them around 10 lakhs till now. So for those people	The DGM, NHAI CMU Mathura Sh. Dheeraj singh explained that the said matter relates to PIU

	who do not give money to us- no money no possession	Ghaziabad and does not come under him but still he will check it. Further they are only looking at Delhi – Agra Road & Jewar Expressway Road.
	After acquisition of land, farmer's land will fall on both sides of the expressway but he has 1 boring which would be on one side of the road. Please do something to provide a boring pipe under the road for irrigation on both sides.	The Deputy Commissioner, Faridabad Sh. Jitendar Yadav assured that the administration pipes of the farmer will be installed on both sides for irrigation and he will ensure that farmers get their due compensation as per order of the Hon'ble Supreme Court.
6	**Question by Sh Dinesh Kumar, Regional Officer, HSPCB, Ballabgarh Region:**	
	What is the management doing for the total 3000 trees being cut?	Dr. R.S.Gangwar Environment Specialist DPR Consultant SA Infra Noida explained that there is a provision to plant 10 trees for every 1 tree that is cut and plantation will be done as per the Forest Conservation Act. Green road will be built. The Deputy Commissioner, Faridabad Sh. Jitendar Yadav further requested that Bel trees may be planted from Panehra to Mohana which also requires support & cooperation from the villagers and only then the plantation will survive.
	What will the NHAI do to abate pollution during the construction phase?	Dr. R.S.Gangwar Environment Specialist DPR Consultant SA Infra Noida explained that construction material will be covered and all the rules of HSPCB will be followed. Water sprinkling will be done.

Dinesh

Yadav

	Will Anti-smog guns be used or not?.	Dr. R.S.Gangwar Environment Specialist DPR Consultant SA Infra Noida explained that anti-smog guns will be used during the construction phase.
	NHAI may assure proper handling of C & D Waste as per guidelines.	Dr. R.S.Gangwar Environment Specialist DPR Consultant SA Infra Noida explained that they will comply.
7	**Name: Mr. Mukesh Singh S/o: Sh. Giriraj Singh Village: Mohna**	
	I had planted trees along the KGP but the plants died as there is no one to tend to them, so plantation may be done during monsoon season.	The DGM, NHAI CMU Mathura Sh. Dheeraj singh agreed that Monsoon season is good for plantation and plantation will be done in the same season and they also require the support and cooperation from villagers as well.
	During construction in Village Panehra, dust and sand on the roads used to make the roads slippery after rainy season which led to accidents so same should be lifted from the roads to avoid slippery roads and accidents during construction of this expressway	The DGM NHAI, CMU Mathura, Sh. Dheeraj singh explained that during construction phase all measures will be taken to and it will not happen again in this project
	Tree Guards are required to protect the new plantation. Save trees, Save the environment.	The DGM, NHAI CMU Mathura Sh. Dheeraj singh has explained that during plantation We will also keep guard at the time of planting trees and the villagers will also have to take care.
8	**Question by Mr. D.K.Sharma S/o: Sh. Dayalal Sharma Village: Panhera Khurd**	
	There is a Bhandara(function) on 03/06/2022 where Hon'ble Chief Minister, Uttar Pradesh Sh. Yogi Adityanath Ji & Hon'ble Chief Minister, Haryana, Sh. Manohar Lal Khattar Ji is coming- It is requested	The Deputy Commissioner, Faridabad Sh. Jitendar Yadav stated that the same is in their knowledge and remaining work will be completed soon. Moreover, all villagers should also

Yadav

	to prepare adequate roads so that it will be a good impression from Govt. of Haryana.	come forward to save the environment.
	How will the water requirement be managed for those farmers whose land will be bisected by Highway. NHAI may provide the facility for laying pipelines during construction.	The Deputy Commissioner, Faridabad Sh. Jitendar Yadav stated that the farmers may bring their pipes and NHAI will lay the same.
9	**Question by Sh. Ujjwal Kumar, AEE, Regional Office, HSPCB, Ballabgarh Region.**	
	Wherever tree plantation will be done, it would be better if plantation is carried out as per Miyawaki Afforestation technique to have better long term effects.	Dr. R.S.Gangwar Environment Specialist DPR Consultant SA Infra Noida explained that the same will be considered.
	During Construction what will be the source of water for construction and sprinkling? If any groundwater is used or if its sourced through Tankers then the permission from CGWA/HWRA should be taken first before using Ground water. If tankers are bringing water then CGWA/HWRA permission for extraction of Ground Water should be checked of these tankers. Further before using any other water source, treated water from Government STPs & CETPs should be used in sprinkling and construction phase and where TDS of treated water from Government STPs/CETPs is more than desired then this treated water may be used partially after dilution with other water.	Dr. R.S.Gangwar Environment Specialist DPR Consultant SA Infra Noida submitted that they will use surface water only after taking permission from CGWA/ HWRA and use treated water from Government STPs & CETP during the construction phase for sprinkling and Construction.
	What measures are being taken for movement of Animals and if there are any dedicated Animal passages	Dr. R.S.Gangwar Environment Specialist DPR Consultant SA Infra Noida explained that there are 57

	or not	box culverts and many under passes so no animals will have any problem during the construction period.
	Sometimes there are wildlife & cattle accidents on the road because of the wide 6 lane road and high speed limits for vehicles so what measures will be taken?	Dr. R.S.Gangwar Environment Specialist DPR Consultant SA Infra Noida explained that there will be fencing on both sides of the road; no animal will come on the road.
	Will any ash from Thermal Power Plants be used in construction? If yes then it should be covered to prevent air pollution.	Dr. R.S.Gangwar Environment Specialist DPR Consultant SA Infra Noida submitted that they will be using Fly ash and definitely follow all guidelines to prevent air pollution
10	**Question by DRO Faridabad. Sh. Virendar Singh Rana**	
	Will Solar power be used or not?	Dr. R.S.Gangwar Environment Specialist DPR Consultant SA Infra Noida informed that they will be using Solar power.
	There should be access from Khadar village because 44 acres of land is near Palwal district and by not giving access at Khadar, it will be quite far for 20-25 villages and it won't be that beneficial for them.	Dr. R.S.Gangwar Environment Specialist DPR Consultant SA Infra Noida explained that it is not possible to give access everywhere along the proposed alignment. The Deputy Commissioner, Faridabad Sh. Jitendar Yadav stated that a survey may be conducted if required and needful may be done.
11	**Name: Mr. Pandit ji S/o: Sh. Om Prakash ji** **Village: Hirapur**	
	I have not received any notice whether my land has been acquired or not so if I have missed it please let me know so that I can get due compensation for my acquired land.	The DGM, NHAI CMU Mathura Sh. Dheeraj singh explained that they will reverify if the notice has been issued to you and no one will be left out
	Due to the pit/depression under	The DGM, NHAI CMU Mathura Sh.

	the culvert, water gets accumulated in it during the time of construction because of which the villagers face problems so some solutions have to be found.	Dheeraj singh assured that during construction phase everything will be taken care of, it will not happen in this project.
12	**Name: Mr. Tara Chand Ji S/o: Sh. Sammwalia** **Village: Hirapur**	
	The demarcating pole has been installed in the ground but the due compensation has not been received.	The DGM, NHAI CMU Mathura Sh. Dheeraj singh assured that all farmers whose land will be acquired will get their due compensation.
13	**Name: Mr. Satish Kr. S/o: Sh. Dharam Singh** **Village: Mohna**	
	The pipelines have been laid in the ground, will its compensation be given or not.	The DGM, NHAI CMU Mathura, Sh. Dheeraj Singh explained that if NHAI acquires farmer's land or if they do anything to their land then due compensation will be given to the farmers.

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Date: / /

Public Hearing

28/04/2022

Mohna Tehsil.

Faridabad District

2070062/2022/Estt.Br

Page No:
Date: / /

Sr.No.	Name	father's Name	Address	Signature
1	Sh. Jitender Yadav	Deputy Commissioner, Faridabad		Yadav
2	Nitesh Kumar,	R.O., HSPCB	Ballabgarh Region	
3	DHIRAJ Singh	DGM VHAI	Faridabad	
4	BIJENDER RANA	D.R.O Fbd		
5	AJAY KUMAR	H.T. Mohna	Tehsildar	Mohna
6	DHEERAJ KUMAR	R.C. Mohna	Sub Tehsil Mohna	
7	Sanjeev Sharma	Patwari	Mohna	
8	Ujjwal Kumar	AEE HSPCB, Ballabgarh Region		
9	Ranjeet Singh	Sarpanch Mohna	Mohna	Ranjeet Sgh
10	[illegible]	[illegible]	MOHNA	CHAYRMAN
11	Sundaram Pandey	DPR Consultant	Noida	
12	Nand Kishor Sharma	Sitaram Sharma	Hirapur	
13	Hukam	Amar Singh	11	
14	Vishnu dutt	Premraj	Mohna	
15	Hukam	Jhuma	Mohna	
16	Subhash	Shri meharchand	Pachera Khurd	
17	Shri Krishan Sharma	Meharchand	Pachera Khurd	
18	Premchand	Bhajanlal	Mohna	
19	Shankar	Jadhuram	Mohna	
20	Premchand	Khemchand	Mohna	
21	Rajpathri	Bishan Singh	Mohna	
22	Hukam chand	Ganga Lal	Hirapur	
23	Lakhmi chand	B Gyasi Ram	Hirapur	
24	Jeet Ram	Simichand	Hirapur	
25	Harkesh	Chiriraj	Mohna	
26	Indar Jeet	Bahal Singh	Mohna	
27	Babu chokidar	Tularam	Chhaygaon	

Page No:
Date: / /

Sr.No	Name	Father's Name	Address	Signature
28	Om Prakash	Akhe Singh	Chhaysa	[illegible]
29	Lakshman	Sheshram	Gopi kheda	
30	Devraj	Chasu	Mirapur	[illegible]
31	Mange Ram	Balla	Mirapur	[illegible]
32	Akash	Jagnarayan	Mirapur	[illegible]
33	Naval chand	Chhanni	Mirapur	[illegible]
34	Gopal	Bhajanlal	Mirapur	[illegible]
35	Kuldeep	Bishan Singh	Mohna	Kuldeep
36	Sonu	Dinesh	Heerapur	[illegible]
37	Premchand	Khemchand	Mohna	[illegible]
38	Mohar Ram	Chhaju Ram	Heerapur	[illegible]
39	Santram Sharma	S/ Sh. Sukhiram	Heerapur	[illegible]
40	Tuki	Suki	Heerapur	
41	[illegible]	[illegible]	[illegible]	[illegible]
42	Pramod	Rajveer	Mohna	[illegible]
43	Giriraj Sharma	Kishan Sharma	Mohna	[illegible]
44	Jaypal Singh	Jaswant Singh	Mohna	[illegible]
45	Mahendra Singh	Shrilal	Mohna	Mahendra
46	Basant	Badan Singh	Mohna	Basant
47	Hukamchand	S/o Sh. Sukhanlal	Mohna	[illegible]
48	Surender	Omkar	Mohna	Surender
49	Ashok Kumar	Shyam Singh	Mohna	Ashok
50	Bramdutt	Raghuveer	Mohmadpur	[illegible]
51	Govind Ram Sharma	S/o late Sh. Jagni	Mehmedpur	[illegible]
52	[illegible]	[illegible]	[illegible]	[illegible]
53	Bir Singh	Late Sh. Rufa	Mohna	[illegible]
54	[illegible]	[illegible]	[illegible]	[illegible]
55	R.S. bala	Bhudutt	Mirapur	

/Estt.Br

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Date: / /

Sr.No	Name	Father's Name	Address	Signature
56	Chanchal Ram	Babu Ram	Hisar	
57	[illegible]		Sirsa	
58	[illegible]	[illegible]	[illegible]	
59	DK Sharma	Gaya Lal Sharma	[illegible]	
60.	Surender Tanwar	Kishori	Mohna	
61	[illegible]		Mohna	
62	Bagichan	Shrichand.	Hisar	
63	[illegible]	S/o [illegible]	[illegible]	
64	[illegible]	[illegible]	[illegible]	
65	Sumer Singh.	Rato Ram	Mohna.	
66	Nitin	S/. Parma	Mohna	
67	Balkishan	S/. Harishanker	Mohna	
68	Bajmohan	Kamal.	Mahand	
69	Devender	Kamal Dutt	Mahendergarh	
	Rajesh Kumar Vishnu	Sushant	P&M Solution	

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण
(सड़क परिवहन एवं राजमार्ग मंत्रालय, भारत सरकार)
परियोजना गलियारा इकाई–मथुरा (फरीदाबाद)
प्लॉट सं० 8, टोल प्लाजा भवन के समीप, मथुरा रोड, फरीदाबाद–121003
National Highways Authority of India
(Ministry of Road Transport & Highways, Govt. of India)
Corridor Management Unit -Mathura (At Faridabad)
Plot No.8, Near Sarai Toll Plaza Building, Mathura Road Faridabad - 121003
फोन / Phone: 0129-
वेबसाइट / Website: www.nhai.gov.in
ईमेल Email: nai@nhai.org

सत्यमेव जयते

NHAI/CMU/MTR/F-4 (GBN)/2022/D- 65255

Dated: 18.02.2022

AEE/AEE-
Date........23/2/22

To,

The Member Secretary,
Haryana State Pollution Control Board,
C-6, Sector 6, Panchkula, Haryana

Sub: Proposal Conduct of Public hearing for our project "Construction of 6 lane Greenfield connectivity from DND-Faridabad-Ballabhgarh bypass (from km 32+600) to Jewar International Airport under BharatmalaPariyojna (Lot-4/Pkg-1) in the State of Haryana and Uttar Pradesh.

Ref: (i)TOR Issued by MoEF&CCToR No. 10/46/2021-IA.III dated 30th November, 2021, Proposal no.IA/HR/NCP/232701/2021.
(ii) DPR Consultant letter no. SAICPL/Bharatmala/DPR/LOT-4/PKG-1/2022/17100 Dated 09.02.2022

Sir,

In reference to Terms of Reference (ToR) granted by the MoEF&CC as mentioned under reference, the DPR Consultant M/s SA Infrastructure Consultants Pvt Ltd has prepared a Draft EIA/EMP report for conducting public hearing as per the EIA Notification, 2006.

We are hereby submitting a set of 20 copies of draft EIA/EMP reports along with the soft copy in CD, 20 copies of Executive summary reports in English, 20 copies of Executive summary reports in Hindi to your office along with DD amounting to Rs.3,00,000/- (DD No-518199 Date 11.02.2022 & 518201 Date 11.02.2022) (Rs.1,50,000 each for Faridabad district and Palwal district) as public hearing Fee.

In view of above, it is kindly requested to process our application expeditiously for conducting public consultation/ hearing at the earliest being a high priority project MoRTH, Government of India.

Thanking you,

Yours faithfully,

Enc: As above

CC: (1) Regional Offices, HSPCB, ~~Faridabad~~ Ballabhgarh div – 10 DEIA reports with CDs & summary
(2) Regional Offices, HSPCB, Palwal – 10 DEIA reports with CDs & summary

General Managr (T) &,
Project Director
CMU- Mathura

Copy to:- (I) The Regional Officer-Delhi, NHAI HQ, New Delhi for information please.
(ii) Authorized Signatory, M/s SA Infrastructure Consultants Pvt. Ltd. to co-ordinent with PCB for early action in the matter

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

of

Draft EIA for the Construction of 6 lane Greenfield connectivity from DND-Faridabad-Ballabhgarh bypass (from km 32+600) to Jewar International Airport under Bharatmala Pariyojna (Lot-4/Pkg-1) in the State of Haryana and Uttar Pradesh. Proposed Length – 31.060 Km

(Baseline monitoring period- October, 2021 to December, 2021)

Proposal No.	**IA/HR/NCP/232701/2021**
Total Length	**31.060 Km**

PROJECT PROPONENT:
National Highways Authority of India (NHAI)

ENVIRONMENT CONSULTANT:

CONSULTANT
P&M Solution
C-88, Sector 65, Noida -201301 – U.P
A QCI –NABET Accredited Organization

कार्यकारी सारांश

परिचय

सड़क परिवहन और राजमार्ग मंत्रालय (MORTH),भारत सरकार ने भारतीय राष्ट्रीय राजमार्ग प्राधिकरण (NHAI) के माध्यम से सड़क विकास परियोजना की अम्ब्रेला स्कीम "भारतमाला परियोजना" का प्रस्ताव दिया है। राष्ट्रीय राजमार्ग, औद्योगिक विकास निगम लिमिटेड (NHIDCL) और राज्य लोक निर्माण विभाग (PWD) की अनुमानित लागत 1,906 करोड़ रुपये है।

यह NHDP के बाद देश में दूसरी सबसे बड़ी राजमार्ग निर्माण परियोजना है,जहां देश भर में लगभग 31,060 किलोमीटर सड़कों का लक्ष्य रखा गया है।

प्रस्तावित राजमार्ग जंक्शन से बल्लभगढ़ बाईपास के साथ गांव चंदावाली CH: 0+000 (जिला-फरीदाबाद, हरियाणा) के पास से शुरू होता है औरलभ नगर उरफ करोल बांगर गांव CH : 31+060 (जिला- गौतम बौद्ध नगर, उत्तर) के पास जेवर अंतरराष्ट्रीय हवाई अड्डे पर समाप्त होता है। हरियाणा और उत्तर प्रदेश राज्य में फरीदाबाद, पलवल और गौतम बौद्ध नगर जिलों से होकर गुजरती है।।

वर्तमान प्रतिवेदन (रिपोर्ट) का दायरा (CH 0+000 से CH : 31+060) तक सीमित है।

यह एक हरित क्षेत्र संरेखण (green field alignment) है, और 6-लेन के लिए प्रस्तावित है। परियोजना राजमार्ग की प्रस्तावित लंबाई लगभग 31.060 किलोमीटर है।

यह सड़क हरियाणा और उत्तर प्रदेश राज्य के बल्लभगढ़ , मोहना, पलवल, जेवर जैसे महत्वपूर्ण गांवों / कस्बों के माध्यम से फरीदाबाद, पलवल और गौतम बौद्ध नगर जिलों से गुजरती है।।

परियोजना की मुख्य विशेषताएं

क्रमांक	पैरामीटर/ मुद्दे	विवरण
1	लम्बाई (किलोमीटर)	31.060
2	कुल अधिग्रहित भूमि (हेक्टेयर)	224.435
3	सरकारी भूमि (हेक्टेयर)	20.435
4	निजी भूमि (हेक्टेयर)	200
5	वन भूमि (हेक्टेयर)	4
6	वनस्पतियों जीवों/वन्यजीव अभयारण्यों की संरक्षित/महत्वपूर्ण या संवेदनशील प्रजातियों के अंतर्गत क्षेत्र	संरेखण (alignment) किसी वन्य जीव अभ्यारण्य , संरक्षित क्षेत्र और इसके पर्यावरण संवेदनशील क्षेत्र से नहीं गुजरता है।
7	पेड़ों की संख्या	3000

8	प्रस्तावित संरेखण के कारण प्रभावित होने वाली संरचना की संख्या	57
9	निर्माण की जाने वाली संरचना की संख्या	i. प्रमुखपुल **(01)** ii. छोटेपुल **(01)** iii. वाहनअंडरपास **(05)** iv. एलवीयूपी **(17)** v. फ्लाईओवर **(01)** vi. आरओबी **(01)** vii. बॉक्सकल्वर्ट्स **(57)**
11	कुल जल मांग	9717 किलोलीटर /दिन। सतही स्रोतों से पानी निकाला जाएगा। सक्षम पदाधिकारी से अनुमति प्राप्त करने के बाद शिविर स्थल के लिए भूजल निकाला जाएगा।
12	सड़क सीमा	आवश्यकता के अनुसार 60 मी , 6 लेन ड्यूल कैरिज वे कॉन्फिगरेशन के साथ पूरी तरह से नियंत्रित राजमार्ग ।
13	निर्माण सामग्री	मोटी गिट्टी (घन मीटर)- 3515 फाइन गिट्टी (घन मीटर) – 56066 सीमेंट (एमटी) – 664 स्टील (टन) – 9469 बिटुमेन (टन) – 15339 बिटुमेनइमल्शन (टन) – 926
14	संपर्क (कनेक्टिविटी)	प्रस्तावित राजमार्ग ग्राम चंदावाली (जिला-फरीदाबाद, हरियाणा) के पास बल्लगढ़ बाईपास के साथ जंक्शन से शुरू होता है औरल्लभ नगर उरफ करोल बांगर गांव (जिला-गौतम बौद्ध नगर, उत्तर प्रदेश) के पास जेवर अंतरराष्ट्रीय हवाई अड्डे पर समाप्त होता है। CH 0+000 से CH : 31+060.
15	परियोजना लागत (करोड़ में)	1906

टेबल बेसलाइन पर्यावरणीय स्थिति

पैरामीटर/ मुद्दे	बेसलाइन स्थिति
वायु गुणवत्ता कि निगरानी	5 AAQ निगरानी(मॉनिटरिंग) स्टेशनों कि परिवेशी वायु गुणवत्ता निगरानी से पता चलता है कि PM10 के न्यूनतम एकाग्रता 53.40 µg/m3 (AAQ4- फ़ैलदा बंगारी -30+600) और अधिकतम एकाग्रता 85.75 µg/m3 (AAQ1- शाहूपुर -01+200) के बीच पाई गई। PM2.5 के परिणाम से पता चलता है कि न्यूनतम एकाग्रता 26.01 µg/m3 (AAQ1- शाहूपुर -01+200) और अधिकतम एकाग्रता 49.47 µg/m3 (AAQ3- मोहना - 14+900) के बीच पाई गई। आवासीय और ग्रामीण क्षेत्रों के सभी स्टेशनों पर गैसीय प्रदूषक SO2 और NOx ,निर्धारित CPCB सीमा (80 µg/m3) के भीतर थे। SO2 की न्यूनतम और अधिकतम एकाग्रता 8.16 µg/m3 (AAQ3- मोहना - 14+900) से 13.14 µg/ m3 (AAQ4- फ़ैलदा बंगारी -30+600) के बीच पाई गई । NOx की न्यूनतम और अधिकतम एकाग्रता 10.24 µg/ m3 (AAQ5- दयांत पुरी - 31+100) से 16.78 µg/m3. (AAQ2- पन्हेरा खुर्दो -08+800) ।
ध्वनि का स्तर	6 स्थानों पर ध्वनि की निगरानी की गई। निगरानी कार्यक्रम के परिणामों ने संकेत दिया कि दिन और रात दोनों समय के शोर के स्तर, NAAQS की निर्धारित सीमा के भीतर थे और कुछ स्थानों पर वाहन घनत्व में वृद्धि के कारण पीएम स्तर में मामूली वृद्धि हुई ।
जल की गुणवत्ता	5 भूजल नमूनों (सैम्पल्स) का विश्लेषण किया गया और निष्कर्ष निकाला गया कि: सभी सूत्रों से भूजल पीने के प्रयोजनों के लिए उपयुक्त रहता है क्योंकि सभी घटक भारतीय मानक IS: 10500 द्वारा प्रदत्त पेय जल मानकों द्वारा निर्धारित सीमा के भीतर हैं।
मिट्टी की गुणवत्ता	पहचाने गए स्थानों से एकत्र किए गए नमूने संकेत करते हैं कि मिट्टी रेतीले प्रकार की है और पीएच मान 7.27 से 7.62 के बीच है। जिससे पता चलता है कि मिट्टी प्रकृति में क्षारीय है। एकत्रित मिट्टी के नमूनों में कंडक्टिविटी 378-518 µmhos/cm के बीच है। जल धारण क्षमता 31.92 से 35.98 % के बीच है।
पारिस्थिति की और जैव विविधता	अध्ययन क्षेत्र में कोई पारिस्थितिक रूप से संवेदनशील क्षेत्र मौजूद नहीं हैं।

प्रत्याशित पर्यावरणीय प्रभाव और शमन उपाय

•हीट आइलैंड प्रभाव के कारण क्षेत्र की सूक्ष्म जलवायु में मामूली बदलाव की उम्मीद है।

•निर्माण गतिविधियों के दौरान पीएम स्तर में मामूली वृद्धि होगी , जो निर्माण गतिविधियों के समाप्त होने के बाद फिर से निर्धारित सीमा के भीतर होगी।

•सड़क के निर्माण के बाद वाहन घनत्व में वृद्धि के कारण क्षेत्र में ध्वनि स्तर में मामूली वृद्धि होने की संभावना है।

• निर्माण सामग्री, तेल, ग्रीस, ईंधन और पेंट आदि के फैलने के कारण जल निकायों में संदूषण हो सकता है। यह उन स्थानों के मामले में अधिक प्रमुख होगा जहां परियोजना सड़क नदियों, नहरों, नाले आदि को पार करती है। शमन उपायों की योजना बनाई गई है ताकि इन जलाशयों को दूषित होने से बचाया जा सके।

•इस परियोजना के लिए वनभूमि के व्यपवर्तन की परिकल्पना की गई है। इसलिए, वन (संरक्षण) अधिनियम, 1980 के दायरे में वन मंजूरी आवश्यक है। वन मंजूरी के आवेदन की प्रक्रिया चल रही है। शमन उपाय के रूप में पर्याप्त प्रतिपूरक वनरोपण की योजना बनाई गई है। परियोजना सड़क किसी भी Protected Area (संरक्षित क्षेत्र) को पार नहीं करती है। चूंकि परियोजना सड़क एक ग्रीन फील्ड परियोजना है, इसलिए भूमि का अधिग्रहण आवश्यक होगा।

•प्रस्तावित परियोजना के निर्माण के दौरान, परियोजना सड़क के लिए कट और भराव और परियोजना से संबंधित संरचनाओं के निर्माण आदि के कारण स्थलाकृति में मामूली बदलाव हो सकता है।

•सामग्री संचालन के लिए निर्माण यार्ड का प्रावधान भी मौजूदा स्थलाकृति को बदल देगा।

विकल्पों का विश्लेषण (प्रौद्योगिकी और साइट)

विकल्पों का विस्तृत विश्लेषण परियोजना के साथ और उसके बिना दोनों को ध्यान में रखते हुए किया गया है। सभी विकल्पों का तुलनात्मक विश्लेषण भी किया गया है। सड़क के प्रस्तावित विकास से क्षेत्र के आर्थिक मूल्य पर सकारात्मक प्रभाव पड़ने की संभावना है।

तीन विकल्प अध्ययन किये गए थे और दूसरा विकल्प सबसे उपयुक्त पाया गया।

पर्यावरण निगरानी कार्यक्रम

प्रस्तावित परियोजना के संचालन के दौरान पर्यावरण की स्थिति का आकलन करने के लिए महत्वपूर्ण पर्यावरणीय मापदंडों की नियमित निगरानी अनिवार्य है। आधारभूत स्थितियों के ज्ञान के साथ, निगरानी कार्यक्रम परियोजना के संचालन के कारण पर्यावरणीय परिस्थितियों में किसी भी गिरावट के लिए एक

संकेतक के रूप में कार्य कर सकता है और पर्यावरण की सुरक्षा के लिए समय पर उपयुक्त शमन कदम उठाए जा सकते हैं। निगरानी प्रदूषण के नियंत्रण की तरह ही महत्वपूर्ण है क्योंकि नियंत्रण उपायों की प्रभाव शीलता केवल निगरानी द्वारा ही निर्धारित की जा सकती है।

अतिरिक्त अध्ययन

परियोजना के लिए सार्वजनिक परामर्श, जोखिम मूल्यांकन और सामाजिक प्रभाव आकलन/(R&R) कार्य योजनाओं सहित विभिन्न अतिरिक्त अध्ययन किए गए हैं। सार्वजनिक परामर्श एक सतत प्रक्रिया है और पूरे प्रोजेक्ट रोड में सभी चरणों में किया गया है। प्रभावित परिवारों के विचारों को दर्ज करने के लिए और सामाजिक प्रभाव आकलन रिपोर्ट में शामिल किया गया है।

परियोजना के लाभ

- प्रस्तावित सड़क परियोजना का मुख्य उद्देश्य हरियाणा और उत्तर प्रदेश राज्य में दूरी और यात्रा के समय को कम करना और दूरदराज के क्षेत्रों और प्रमुख शहरों को जोड़ना है। परियोजना इन क्षेत्रों के विकास पर जोर देती है और उन्हें संसाधनों के साथ उपलब्ध कराती है।
- इस परियोजना के अनेकों लाभ है :-
  - प्रस्तावित राजमार्ग ग्राम चंदावाली (जिला-फरीदाबाद, हरियाणा) के पास बल्लभगढ़ बाईपास के साथ जंक्शन से शुरू होता है औरल्लभ नगर उर्फ करोल बांगर गांव (जिला-गौतम बौद्ध नगर, उत्तर प्रदेश) के पास जेवर अंतरराष्ट्रीय हवाई अड्डे पर समाप्त होता है।
  - इस परियोजना के आस पास के क्षेत्र में आने वाले गाँवों-कस्बो की आर्थिक उन्नति होगी ।
  - कृषि बाजार पहुंच में सुविधा होगी ।
  - औद्योगिक संपर्क (कनेक्टिविटी) को बढ़ावा मिलेगा ।
  - प्रस्तावित सड़क परियोजना के आस पास स्कूल , कॉलेज , हॉस्पिटल के निर्माण में बढ़ावा मिलेगा ।
  - प्रस्तावित सड़क परियोजना के आस पास के लोगो को योग्यता अनुसार रोज़गार के अवसर प्रदान होंगे ।

पर्यावरण प्रबंधन योजना (ई एम पी)

- पर्यावरण प्रबंधन योजना (ईएमपी) को पर्यावरण और सामाजिक-आर्थिक पहलुओं पर विभिन्न नियम आवश्यकताओं के ढांचे के भीतर डिजाइन किया गया है, जिसका लक्ष्य निम्नलिखित है:
  - देशी वनस्पतियों और जीवों, यदि कोई हो, वह कम से कम प्रभावित हो।

- वायु, जल, मिट्टी और ध्वनिप्रदूषण, को रोकना और कम करना।
- सामाजिक-आर्थिक विकास को बढ़ावा देना।
- संभावित प्रभावों (सकारात्मक या नकारात्मक), पर्यावरणीय नकारात्मक प्रभाव को कम करना , कार्यान्वयन अनुसूची और निगरानी योजनाओं को एकीकृत करना।
- परियोजना विकास के प्रत्येक चरण से जुड़े संभावित पर्यावरणीय प्रभावों और प्रस्तावित प्रबंधन का वर्णन करना।
- स्वीकार्य मानकों के भीतर पर्यावरणीय प्रभावों को नियंत्रित करने के लिए, और परियोजना के निर्माण और बाद के परिचालन चरणों के दौरान समुदाय और संभावित जोखिमों के कार्यबल पर संभावित प्रभाव को कम करने के लिए।

निष्कर्ष

पर्यावरण प्रभाव आकलन रिपोर्ट अध्ययन और परियोजना के लिए किए गए सर्वेक्षणों के आधार पर , यह निश्चित रूप से निष्कर्ष निकाला जा सकता है कि संभावित प्रतिकूल पर्यावरणीय प्रभाव को रिपोर्ट में बताए गए उपायों के पर्याप्त कार्यान्वयन द्वारा स्वीकार्य स्तर तक कम किया जा सकता है। पर्यावरण बजट में सुझाई गई पर्यावरणीय शमन और निगरानी आवश्यकताओं , और उनकी संबद्ध लागतों को पूरा करने के लिए परियोजना में पर्याप्त प्रावधान किए जाएंगे। प्रस्तावित परियोजना से सड़क दक्षता में सुधार होगा और आर्थिक विकास होगा। प्रस्तावित सड़क परियोजना का मुख्य उद्देश्य हरियाणा और उत्तर प्रदेश राज्य में दूरी और यात्रा के समय को कम करना और दूरदराज के क्षेत्रों और प्रमुख शहरों को जोड़ना है। परियोजना इन क्षेत्रों के विकास पर जोर देती है और उन्हें संसाधनों के साथ उपलब्ध कराती है। राज्यमार्ग के आस पास हरी पट्टी का विकास किया जाएगा जिससे की प्रदुषण कम होगा ।

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EXECUTIVE SUMMARY

Draft EIA for the Construction of 6 lane Greenfield connectivity from DND-Faridabad-Ballabhgarh bypass (from km 32+600) to Jewar International Airport under Bharatmala Pariyojna (Lot-4/Pkg-1) in the State of Haryana and Uttar Pradesh.

Proposed Length – 31.060 Km

APPLICANT

National Highway Authority of India, New Delhi

EIA Consultants :

CONSULTANT
P&M Solution
C-88, Sector 65, Noida -201301 – U.P
A QCI –NABET Accredited Organization

www.pmsolution.in
Accreditation No. : NABET/EIA/1992/IA0053

EXECUTIVE SUMMARY

1.1 INTRODUCTION

Ministry of Road Transport and Highways, Government of India, has decided to improve the efficiency of freight movement in India. National Highways Authority of India (NHAI) has been entrusted for preparation of DPR to improve the road networks between Haryana and Uttar Pradesh. The proposed access controlled highway project with new alignment has been envisaged through an area that shall have the advantage of simultaneous development as well as shall result in a shorter distance to travel. The junctions with existing road will be planned in the form of interchanges and flyover to ensure uninterrupted flow of traffic.

The proposed road would act as connecting highway between Delhi-Mumbai expressways to Jewar Airport. It will enhance economic development, provide employment opportunities to locals, strengthen tourist development, ensure road safety, and provide better transportation facilities. Vehicle operating cost will also be reduced due to improved road quality. The compensatory plantation and roadside plantation shall further improve the air quality of the region.

1.2 DESCRIPTION OF THE PROJECT

The proposed highway starts from Junction with Ballabhgarh Bypass near village Chandawali CH: 0+000 (District-Faridabad, Haryana) and terminating at Jewar International Airport near Ballabh Nagar Urf Karol Bangar village CH: 31+060 (District- Gautam Buddh Nagar, Uttar Pradesh) passing through districts Faridabad, Palwal & Gautam Buddh Nagar in the state of Haryana & Uttar-Pradesh.

Scope of present report is confined to the (Ch. 0+000 to Ch. 31+060).

The Proposed ROW of this section is taken as 60m in which all the configurations shall be fitted with. This is a green field alignment, and is proposed for 6-Lane. The proposed length of Project Highway is about 31.060 kms.

The road passes through the districts of Faridabad, Palwal & Gautam Buddh Nagar through important villages/towns like Ballabhgarh, Mohna, Palwal, Jewar in the state of Haryana & Uttar-Pradesh.

Table 1.1: Salient features of the project:

S.no.	Parameters/Issues	Description
1.	Length (km)	31.060

2.	Total land acquired (ha)	224.435
3.	Govt. land (ha)	20.435
4.	Pvt. Land (ha)	200
5.	Forest land (ha)	4
6.	Area under protected/ important or sensitive species of flora or fauna/Wildlife Sanctuary	The alignment does not pass through any wild life sanctuary, protected area and its eco sensitive zone.
7.	No. of trees	3000
8.	No. of structure to be impacted due to proposed alignment	57
9.	No. of structure to be constructed	i. Major Bridges (01) ii. Minor Bridges (01) iii. Flyover (01) iv. Vehicular underpass (05) v. LVUP (17) vi. ROB (01) vii. Box Culverts (57)
10.	Total water requirement	9717 KL/day. Water will be extracted from surface sources. The ground water will be abstracted for campsite after obtaining the permission from competent authority.
11.	RoW	60 m as per the requirement keeping in view the fully access controlled Highway with 6-lane dual carriageway configuration.

12.	Construction material	Cement (T)- 664 Coarse Agg. (cum)- 3515 Fine Agg. (cum)- 56066 Steel (ton)- 9469 Bitumen (ton)- 15339 Bitumen Emulsion (ton)- 926
13.	Connectivity	The proposed highway starts from Junction with Ballabhgarh Bypass near village Chandawali(District-Faridabad, Haryana) and terminating at Jewar International Airport near Ballabh Nagar Urf Karol Bangar village (District- Gautam Buddh Nagar, Uttar Pradesh). CH: 0+000 to31+060
14.	Project cost (cr.)	1906

1.3 DESCRIPTION OF THE ENVIRONMENT

The baseline data was generated during Posr-monsoon season of 2021 i.e. Oct to dec 2021. The baseline data has been provided in chapter 3 of this report, which shows the values of almost all of the parameters are well within the prescribed limits.

Attribute	Baseline status
Ambient Air Quality	Ambient Air Quality Monitoring reveals that the minimum and maximum level of PM2.5 recorded within the study area was in the range of 26.01 µg/m3 (at AAQ1- Shahupura -01+200) to 49.47 µg/m3 (at AAQ3- Mohna -14+900). The minimum and maximum level of PM10 recorded within the study area in the range of 53.40 µg/m3 (at AAQ4- Failada Bangar -30+600) to 85.75 µg/m3 (at AAQ1- Shahupura -01+200). The gaseous pollutants SO2 and NOx were within the

	prescribed CPCB limit of 80 µg/m3. For residential and rural areas at all stations. The minimum and maximum concentration of SO2 recorded within the study area was 8.16 µg/m3 (AAQ3- Mohna -14+900) to 13.14 µg/m3 (AAQ4- Failada Bangar -30+600). The minimum and maximum level of NO2 recorded within the study area was in the range of was 10.24 µg/m3 (AAQ5- Dayant Pur -31+100) to 16.78 µg/m3. (AAQ2- Panhera Khurd -08+800).
Noise Levels	Noise monitoring were carried out at 6 locations. The results of the monitoring program indicated that both the daytime and night time levels of noise were well within the prescribed limits of NAAQS to marginal rise in PM levels some locations monitored due to increase in vehicle density.
Water Quality	5 Groundwater samples were analyzed and concluded that: The ground water from all sources remains suitable for drinking purposes as all the constituents are within the limits prescribed by drinking water standards promulgated by Indian Standards IS: 10500.
Soil Quality	Soil pH plays an important role in the availability of nutrients. Soil microbial activity as well as solubility of metal ions is also dependent on pH. In the study area, variations in the pH of the soil were found to be slightly neutral to alkaline (7.27 to 7.62). Electrical conductivity (EC) is a measure of the soluble salts and ionic activity in the soil. In the collected soil samples the conductivity ranged from 378-518 µmhos/cm. Water holding capacity from 31.92 to 35.98 (percentage) by mass.
Ecology and Biodiversity	There are no ecologically sensitive areas passing through the project alignment.

1.4 ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

- Slight change in the micro-climate of the area is expected due to Heat Island Effect.
- There will be a marginal rise in PM levels during the construction activities, which shall again be within prescribed limit after the construction activities are over.
- The area is likely to experience a marginal increase in noise level due to increase in vehicle density after construction of the road.
- Contamination to water bodies may result due to spilling of construction materials, oil, grease, fuel and paint etc. This will be more prominent in case of locations where the project road crosses rivers, canals, nallahs, etc. Mitigation measures have been planned to avoid contamination of these water bodies.
- Diversion of forest land has been envisaged for this project. Hence, Forest Clearance under the purview of Forest (Conservation) Act, 1980 is required. The application of forest clearance is under process. Adequate compensatory afforestation has been planned as a mitigation measure. The project road doesn't cross any Protected Area. Since the project road is a green field project, acquisition of land shall be required.
- During the construction of the proposed project, the topography may change marginally due to cuts & fills for project road and construction of project related structures etc.
- Provision of construction yard for material handling will also alter the existing topography.

1.5 ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

Detailed analyses of the alternatives have been conducted taking into account both with and without project. Comparative analysis of all the alternatives has also been conducted. The proposed development of the road is likely to have a positive impact on the economic value of the region. However, there are certain environment and social issues that need to be mitigated for sustainable development.

Three alternatives were studies and the first one was found out to be most suitable.

1.6 ENVIRONMENTAL MONITORING PROGRAM

Regular monitoring of important and crucial environmental parameters is of immense importance to assess the status of environment during operation of the proposed project.

With the knowledge of baseline conditions, the monitoring program can serve as an indicator for any deterioration in environmental conditions due to operation of the project and suitable

mitigating steps could be taken in time to safeguard the environment. Monitoring is as important as that of control of pollution since the efficacy of control measures can only be determined by monitoring.

1.7 ADDITIONAL STUDIES

The various additional studies have been undertaken for the project including Public Consultation, Risk assessment and Social Impact Assessment/ R&R Action Plans. Public consultation is a continuous process and has been carried out at all stages throughout the project road. To ascertain the views of the affected families to be recorded and has been included in the Social Impact Assessment report.

1.8 BENEFITS OF THE PROJECT

The proposed highway starts from Junction with Ballabhgarh Bypass near village Chandawali (District-Faridabad, Haryana) and terminating at Jewar International Airport near Ballabh Nagar Urf Karol Bangar village (District- Gautam Buddh Nagar, Uttar Pradesh). The proposed access controlled project with new alignment has been envisaged through an area which shall have the advantage of simultaneous development as well as shall result in a shorter distance to travel. The junctions with existing road will be planned in the form of interchanges and flyover to ensure uninterrupted flow of traffic.

The proposed road would act as the prime artery for the economic flow to this region. It will Enhance economic development, provide employment opportunities to locals, strengthen tourist development, ensure road safety, and provide better transportation facilities and other facilities such as wayside amenities. Vehicle operating cost will also be reduced due to improved road quality. The compensatory plantation and roadside plantation shall further improve the air quality of the region.

1.9 ENVIRONMENT MANAGEMENT PLAN

Project specific environmental management plan have been prepared for ensuring the implementation of the proposed measures during construction phase of the project, implementation and supervision responsibilities. The cost for environmental management during construction has been indicated in EMP. The project impacts and management plan suggested thereof are summarized in the chapter.

The Environmental Management Plan (EMP) has been designed within the framework of various regulatory requirements on environmental and Socio-economic aspects aiming at the following:

- Minimize disturbance to native flora and fauna, if any.
- Prevent and to attenuate air, water, soil and noise pollution, if any.
- Encourage the socio-economic development.

The environmental management plan (EMP) would, therefore, consists of following main components:

- To integrate potential impacts (positive or negative), environmental mitigation measures, implementation schedule, and monitoring plans.
- To describe the potential environmental impacts and proposed management associated with each stage of the project development.
- To control environmental impacts to levels within acceptable standards, and to minimize possible impact on the community and the workforce of foreseeable risks during the construction and subsequent operational phases of the project.

1.10 CONCLUSION

Based on the EIA study and surveys conducted for the Project, it can be safely concluded that associated potential adverse environmental impacts can be mitigated to an acceptable level by adequate implementation of the measures as stated in the EIA Report. Adequate provisions shall be made in the Project to cover the environmental mitigation and monitoring requirements, and their associated costs as suggested in environmental budget. The proposed project shall improve Road efficiency and bring economic growth. In terms of air and noise quality, the project shall bring considerable improvement to possible exposure levels to population.

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File No. 10/46/2021-IA.III
[Proposal No. IA/HR/NCP/232701/2021]
Government of India
Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)

Indira Paryavaran Bhawan,
Jor Bagh Road, Aliganj
New Delhi - 110 003

Dated: 30th November., 2021

To

Dr. B. Mukhopadhyay
General Manager
National Highways Authority of India
G-5 & 6, Sector-10, Dwarka, New DElhi-110 075

Subject: Construction of 6 lane Greenfield connectivity from DND-Faridabad-Ballabhgarh bypass (from km 32+600) to Jewar International Airport (Length – 31.060 km) under Bharatmala Pariyojna (Lot-4/Pkg-1) in the State of Haryana and Uttar Pradesh by M/s National Highways Authority of India (NHAI) - Terms of Reference

Sir,

This has reference to your online proposal submitted to this Ministry on 5th October, 2021, seeking Terms of Reference (TOR) for the aforementioned project as per the provisions of the Environment Impact Assessment (EIA) Notification, 2006 and subsequent amendments under the Environment (Protection) Act, 1986.

2. The above mentioned proposal was considered by the Expert Appraisal Committee (EAC) for Infrastructure, CRZ and other miscellaneous projects in its 278th meeting during 27th – 28th October, 2021, in the Ministry of Environment, Forest and Climate Change, New Delhi.

3. The project proponent along with EIA consultant M/s SA Infrastructure Consultants Pvt. Ltd., Uttar Pradesh made a presentation through Video Conferencing and submitted the following information.

i. The proposed project is for construction of 6 lane Greenfield connectivity from DND-Faridabad-Ballabhgarh bypass (from km 32+600) to Jewar International Airport under Bharatmala Pariyojna (Lot-4/Pkg-1) in the State of Haryana and Uttar Pradesh. The proposed highway starts from Junction with Ballabhgarh Bypass near village Chandawali (District-Faridabad, Haryana) and terminating at Jewar International Airport near Ballabh Nagar Urf Karol Bangar village (District- Gautam Buddh Nagar, Uttar Pradesh). CH: 0+000 to 31+060.

ii. The length of the proposed alignment is 31.060 km approx. This is a Greenfield project. The alignment is mainly passing through agriculture land.

iii. The proposed highway starts from Junction with Ballabhgarh Bypass near village Chandawali (District-Faridabad, Haryana) and terminating at Jewar International Airport near Ballabh Nagar Urf Karol Bangar village (District- Gautam Buddh Nagar, Uttar Pradesh).This is a green field alignment, access control and is proposed for 6-Lane. The

main objective of the proposed project is to provide connectivity between Delhi-Mumbai expressways to proposed Jewar Airport.

iv. The Geo-coordinates of the proposed project are 28°19'2.06"N, 77°20'39.89"E (start location), 28°10'30.02"N, 77°34'31.51"E (end location). The project alignment passes through approx. 20 villages the major settlements along the alignment are Ballabhgarh, Mohna, Palwal and Jewar.

v. The proposed project falls under 7(f), Category-A, Highway as per EIA notification 2006. Total Project is 1906.00 Crore.

vi. This is a Greenfield project. The alignment is mainly passing through agriculture land Land use/ Land cover of the project site.

S.No.	Land use/Land cover	Area (ha)	%	Remarks if any
1.	Private land	200	89.11	Agriculture/Barren Land
2.	Government land	20.435	9.11	Agriculture/Barren Land
3.	Forest land	4	1.78	-
	Total	**224.435**	**100**	-

vii. The Proposed Right of Way is 60 m as per the requirement keeping in view the fully access controlled Highway with 6-lane dual carriage way configuration.

viii. The project area is located in the state of Haryana and Uttar Pradesh. The topography in the proposed project area is mainly plain and rolling area. The areas have an elevation ranging from 182.88 m. to 198.12 m.

ix. There are 01 nos. of rivers, 01 Nos. of canal, Rampur Distributary-01 Nos, Nala-01 no falling along the alignment. There shall be no major impact on the drainage system as 84 no.s numbers of structures (such as culverts, minor bridges, major bridges etc.) will be constructed.

x. The total requirement of water for construction phase is estimated to 9,717 KL/day. Water will be extracted from surface sources. The ground water will be abstracted for camp site after obtaining the permission from competent authority.

xi. The alignment will require cutting of approximately 3000 nos. of trees falls in proposed ROW. However, bare minimum no. of trees to be felled for construction of six lane road. Detailed tree inventories will be provided after joint enumeration with the appropriate authority in EIA.

xii. There is no reserved and protected forest but there may be notified protected forest areas (Approx. 4 Ha) at some locations. The forest proposal shall be prepared after consultation with concerned forest officer if it attracts FC under section 2, 1980.

xiii. The proposed alignment does not pass through any National Parks, Wildlife Sanctuary, and Tiger Reserve of any other notified eco-sensitive areas.

xiv. The project alignment (ROW) involves acquisition of 224.435 ha of land which includes

200 ha of private land. 20.435 ha of Government land and 4 Ha of Forest Land.

xv. Land acquisition and R&R issues involved: About 224.435 ha land likely to be acquired as per NH Act 1956; compensation will be given as per RFCT LARR Act, 2013.

xvi. Employment potential: During the construction of the project around 1000 persons would be employed through contractor temporarily for a period of 2 years. During operation phase about 100 persons will be employed through the concerned contractor. Generally, locals are employed by the contractor.

xvii. Benefits of the project - The proposed access controlled project with new alignment has been envisaged through an area which shall have the advantage of simultaneous development as well as shall result in a shorter distance to travel. The proposed road would act as the connecting highway between Ballabhgarh bypass, Delhi-Mumbai Expressway, EPE, Yamuna Expressway and Jewar Airport for the economic flow to this region. It will enhance economic development, provide employment opportunities to locals, strengthen tourist development, ensure road safety, and provide better transportation facilities and other facilities such as way side amenities. Vehicle operating cost will also be reduced due to improved road quality. The compensatory plantation and road side plantation shall further improve the air quality of the region.

xviii. Details of Court cases- No court case is pending against the proposed project

4. The EAC based on the information submitted and clarifications provided by the project proponent and detailed discussions held on all the issues during 278th meeting during 27th – 28th October, 2021, recommended the project for grant of Terms of Reference (ToR) with stipulated specific conditions along with other Standard ToR Conditions.

5. The Ministry of Environment, Forest and Climate Change has considered the proposal based on the recommendations of the Expert Appraisal Committee (Infrastructure, CRZ and other Miscellaneous projects) and hereby decided to grant Terms of Reference for the "Construction of 6 lane Greenfield connectivity from DND-Faridabad-Ballabhgarh bypass (from km 32+600) to Jewar International Airport (Length – 31.060 km) under Bharatmala Pariyojna (Lot-4/Pkg-1) in the State of Haryana and Uttar Pradesh" and for preparation of EIA/EMP report with public consultations under the EIA Notification, 2006 as amended, subject to strict compliance of the following specific conditions, in addition to all standard ToR conditions applicable for such projects.

SPECIFIC CONDITIONS

i. Cumulative impact assessment study should be carried out along the entire stretch including the other packages and the current stretch under consideration.

ii. The proponent shall carry out a detailed traffic flow study to assess inflow of traffic from adjoining areas like airport/urban cities. The detailed traffic planning studies shall include complete design, drawings and traffic circulation plans (taking into consideration integration with proposed alignment and other state roads etc.). Wherever required adequate connectivity in terms of VUP (vehicle underpass)/ PUP (Pedestrian underpass) needs to be included.

iii. Road safety audit (along with accident/black spots analysis) by any third-party competent organization at all stages namely at detailed design stage, construction stage and pre-opening stage to ensure that the project road has been constructed considering all the elements of road safety.

iv. Provide compilation of road kill data on the wildlife on the existing roads (national and state highways) in the vicinity of the proposed project. Provide measures to avoid road kills of wildlife by the way of road kill management plan.

v. The alignment of road should be such that the cutting of trees is kept at bare minimum and for this the proponent shall obtain permission from the competent authorities. Alignment also should be such that it will avoid cutting old and large and heritage trees if any. All such trees should be geo-tagged, photographed and details be submitted in the EIA –EMP report.

vi. The proponent shall carry out a comprehensive socio-economic assessment and also impact on biodiversity with emphasis on impact of ongoing land acquisition on the local people living around the proposed alignment. The Social Impact Assessment should have social indicators which can reflect on impact of acquisition on fertile land. The Social Impact Assessment shall take into consideration of key parameters like people's dependency on fertile agricultural land, socio-economic spectrum, impact of the project at local and regional levels.

vii. As per the Ministry's Office Memorandum F. No. 22-65/2017-IA.III dated 30th Septemher, 2020, the project proponent, based on the commitments made during the public hearing, shall include all the activities required to be taken to fulfil these commitments in the Environment Management Plan along with cost estimates of these activities, in addition to the activities proposed as per recommendations of EIA Studies and the same shall be submitted to the ministry as part of the EIA Report. The EMP shall be implemented at the project cost or any other funding source available with the project proponent.

viii. The Action Plan on the compliance of the recommendations of the CAG as per Ministry's Circular No. J-11013/71/2016-IA.I (M), dated 25th October, 2017 needs to be submitted at the time of appraisal of the project and included in the EIA/EMP Report.

ix. Passage for animal movement has to be detailed in the report (if alignment is passing through Forest area).

x. A comprehensive plan for plantation of three rows of native species, as per IRC guidelines, shall be provided. Such plantation alongside of forest stretch will be over and above the compensatory afforestation. Tree speeies should be samc as per the forest type.

xi. Detailed Biodiversity assessment and conservation/mitigation plan be developed by a reputed institute or by a team of expert of national repute.

GENERAL CONDITIONS

(i) A brief description of the project, project name, nature, size, its importance to the region/state and the country shall be submitted.

(ii) In case the project involves diversion of forests land, guidelines under OM dated 20.03.2013 shall be followed and necessary action be taken accordingly.

(iii) Details of any litigation(s) pending against the project and/or any directions or orders passed by any court of law/any statutory authority against the project to be detailed out.

(iv) Detailed alignment plan, with details such as nature of terrain (plain, rolling, hilly), land use pattern, habitation, cropping pattern, forest area, environmentally sensitive areas, mangroves, notified industrial areas, sand dunes, sea, rivers, lakes, details of villages, tehsils, districts and states, latitude and longitude for important locations falling on the alignment by employing remote sensing techniques followed by "ground truthing" and also through secondary data sources shall be submitted.

(v) Describe various alternatives considered, procedures and criteria adopted for selection of the final alternative with reasons.

(vi) Land use map of the study area to a scale of 1: 25,000 based on recent satellite imagery delineating the crop lands (both single and double crop), agricultural plantations, fallow lands, waste lands, water bodies, built-up areas, forest area and other surface features such as railway tracks, ports, airports, roads, and major industries etc. alongwith detailed ground survey map on 1:2000 scale showing the existing features falling within the right of way namely trees, structures including archaeological & religious, monuments etc. if any, shall be submitted.

(vii) If the proposed route is passing through any hilly area, the measures for ensuring stability of slopes and proposed measures to control soil erosion from embankment shall be examined and submitted.

(viii) If the proposed route involves tunneling, the details of the tunnel and locations of tunneling with geological structural fraction should be provided. In case the road passes through a flood plain of a river, the details of micro-drainage, flood passages and information on flood periodicity at least of the last 50 years in the area shall be examined and submitted.

(ix) If the project is passing through/ located within the notified ecologically sensitive zone (ESZ) around a notified National Park/Wildlife Sanctuary or in the absence of notified ESZ, within 10 km from the boundary of notified National Park/Wildlife Sanctuary, the project proponent may simultaneously apply for the clearance for the standing committee of NBWL. The EC for such project would be subject to obtaining the clearance from the standing committee of NBWL.

(x) Study regarding the animal bypasses/underpasses etc. across the habitation areas shall be carried out. Adequate cattle passes for the movement of agriculture material shall be provided at the stretches passing through habitation areas. Underpasses shall be provided for the movement of Wild animals.

(xi) Study regarding in line with the recent guidelines prepared by Wildlife Institute of India for linear infrastructure with strong emphasis on animal movement and identifying crossing areas and mitigation measures to avoid wildlife mortality.

(xii) The information shall be provided about the details of the trees to be cut including their species and whether it also involves any protected or endangered species. Measures taken to reduce the number of the trees to be removed should be explained in detail. The details of compensatory plantation shall be submitted. The possibilities of relocating the existing trees shall be explored.

(xiii) Necessary green belt shall be provided on both sides of the highway with proper central verge and cost provision should be made for regular maintenance.

(xiv) If the proposed route is passing through a city or town, with houses and human habitation on either side of the road, the necessity for provision of bypasses/diversions/under passes shall be examined and submitted. The proposal should also indicate the location of wayside amenities, which should include petrol stations/service centres, rest areas including public conveyance, etc.

(xv) Details about measures taken for the pedestrian safety and construction of underpasses and foot-over bridges along with flyovers and interchanges shall be submitted.

(xvi) The possibility that the proposed project will adversely affect road traffic in the surrounding areas (e.g. by causing increases in traffic congestion and traffic accidents) shall be addressed.

(xvii) The details of use of fly ash in the road construction, if the project road is located within the 100 km from the Thermal Power Plant shall be examined and submitted.

(xviii) The possibilities of utilizing debris/waste materials available in and around the project area shall be explored.

(xix) The details on compliance with respect to Research Track Notification of Ministry of Road, Transport and Highways shall be submitted.

(xx) The details of sand quarry and borrow area as per OM No.2-30/2012-IA-III dated 18.12.2012 on 'Rationalization of procedure for Environmental Clearance for Highway Projects involving borrow areas for soil and earth" as modified vide OM of even No. dated 19th March 2013, shall be examined and submitted.

(xxi) Climate and meteorology (max and min temperature, relative humidity, rainfall, frequency of tropical cyclones and snow fall); the nearest IMD meteorological station from which climatological data have been obtained to be indicated.

(xxii) The air quality monitoring shall be carried out as per the notification issued on 16th November, 2009. Input data used for Noise and Air quality modelling shall be clearly delineated.

(xxiii) The project activities during construction and operation phases, which will affect the noise levels and the potential for increased noise resulting from this project, shall be identified. Discuss the effect of noise levels on nearby habitations during the construction and operational phases of the proposed highway. Identify noise reduction measures and traffic management strategies to be deployed for reducing the negative impact if any. Prediction of noise levels shall be done by using mathematical modelling at different representative locations.

(xxiv) The impact during construction activities due to generation of fugitive dust from crusher units, air emissions from hot mix plants and vehicles used for transportation of materials and prediction of impact on ambient air quality using appropriate mathematical model, description of model, input requirement and reference of derivation, distribution of major pollutants and presentation in tabular form for easy interpretation shall be examined and carried out.

(xxv) The details about the protection to existing habitations from dust, noise, odour etc. during construction stage shall be examined and submitted.

(xxvi) If the proposed route involves cutting of earth, the details of area to be cut, depth of cut, locations, soil type, volume and quantity of earth and other materials to be removed with location of disposal/ dump sites along with necessary permission.

(xxvii) If the proposed route is passing through low lying areas, details of filling materials and initial and final levels after filling above MSL shall be examined and submitted.

(xxviii) The water bodies including the seasonal ones within the corridor of impacts along with their status, volumetric capacity, quality and likely impacts on them due to the project along with the mitigation measures shall be examined and submitted.

(xxix) The details of water quantity required and source of water including water requirement during the construction stage with supporting data and also classification of ground water based on the CGWA classification, shall be examined and submitted.

(xxx) The details of measures taken during constructions of bridges across rivers/ canals/major or minor drains keeping in view the flooding of the rivers and the life span of the existing bridges shall be examined and submitted. Provision of speed breakers, safety signals, service lanes and foot paths shall be examined at appropriate locations throughout the proposed road to avoid accidents.

(xxxi) If there will be any change in the drainage pattern after the proposed activity, details of changes shall be examined and submitted.

(xxxii) Rain water harvesting pit shall be at least 3 - 5 m above the highest ground water table. Provisions shall be made for oil and grease removal from surface runoff.

(xxxiii) If there is a possibility that the construction/widening of road may cause an impact such as destruction of forest, poaching or reduction in wetland areas, examine the impact and submit details.

(xxxiv) The details of road safety, signage, service roads, vehicular under passes, accident prone zones and the mitigation measures, shall be submitted.

(xxxv) IRC guidelines shall be followed for widening & upgradation of roads.

(xxxvi) The details of social impact assessment due to the proposed construction of the road shall be submitted.

(xxxvii) Examine the road design standards, safety equipment specifications and Management System training to ensure that design details take account of safety concerns and submit the traffic management plan.

(xxxviii) Accident data and geographic distribution shall be reviewed and analyzed to prediet and identify trends - in ease of expansion of the existing highway and provide Post accident emergency assistanee and medical care to aecident victims.

(xxxix) If the proposed project involves any land reelamation, details shall be provided of the activity for which land is to be reclaimed and the area of land to be reclaimed.

(xl) Details of the properties, houses, business activities etc likely to be effected by land acquisition and an estimation of their financial losses, shall be submitted.

(xli) Detailed R&R plan with data on the existing socio-eeonomic status of the population in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternative livelihood concerns/employment and rehabilitation of the displaced people, civil and housing amenities being offered, etc and the schedule of the implementation of the specific project, shall be submitted.

(xlii) The environment management and monitoring plan for construction and operation phases of the project shall be submitted. A eopy of your corporate policy on environment management and sustainable development shall also be submitted.

(xliii) Estimated cost of the project including that of environment management plan (both capital and recurring) and source of funding. Also, the mode of execution of the project, viz, EPC, BOT, etc. shall be submitted.

(xliv) A copy of your CSR policy and plan for meeting the expenditure to address the issues raised during Public Hearing shall be submitted.

(xlv) Deiails of blasting if any, methodology/technique adopted, applicable regulations/permissions, timing of blasting, mitigation measures proposed keeping in view mating season of wildlife.

(xlvi) In case of river/creek crossing, details of the proposed bridges connecting on either banks, the design and traffic circulation at this junction with simulation studies.

(xlvii) Details to ensure free flow of water in case the alignment passes through water bodies/river/streams etc.

(xlviii) In case of bye passes, the details of access control from the nearby habitation/habitation which may come up after the establishment of road.

(xlix) Bridge design in eco sensitive area /mountains be examined keeping in view the rock classification hydrology etc.

(l) Details of litigation pending against the project, if any, with direction/order passed by any Court of Law against the Project should be given.

(li) The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.

(lii) Any further clarification on carrying out the above studies including anticipated impacts due to the project and mitigative measure, project proponent can refer to the model ToR available on Ministry website "http://moef.nic.in/Manual/Highways".

GENERAL GUIDELINES

(i) The EIA document shall be printed on both sides, as for as possible.

(ii) All documents should be properly indexed, page numbered.

(iii) Period/date of data collection should be clearly indicated.

(iv) Authenticated English translation of all material provided in Regional languages.

(v) The letter/application for EC should quote the MoEF&CC File No. and also attach a copy of the letter prescribing the TOR.

(vi) The copy of the letter received from the Ministry on the TOR prescribed for the project should be attached as an annexure to the final EIA-EMP Report.

(vii) The final EIA-EMP report submitted to the Ministry must incorporate the issues in TOR and that raised in Public Hearing. The index of the final EIA-EMP report. must indicate the specific chapter and page no. of the EIA-EMP Report where the specific TOR prescribed by Ministry and the issue raised in the P.H. have been incorporated. Questionnaire related to the project (posted on MoEF&CC website) with all sections duly filled in shall also be submitted at the time of applying for EC.

(viii) Grant of TOR does not mean grant of EC.

(ix) Grant of TOR/EC to the present project does not mean grant of approvals in other regulations such as the Forest (Conservation) Act 1980 or the Wildlife (Protection) Act, 1972.

(x) Grant of EC is also subject to Circulars and Office Memorandum issued under the EIA Notification 2006 and subsequent amendments, which are available on the MoEF&CC website: www.envfor.nic.in.

(xi) The status of accreditation of the EIA consultant with NABET/QCI shall be specifically mentioned. The consultant shall certify that his accreditation is for the sector for which this EIA is prepared.

(xii) On the front page of EIA/EMP reports, the name of the consultant/consultancy firm along with their complete details including their accreditation, if any shall be indicated. The consultant while submitting the EIA/EMP report shall give an undertaking to the effect that the prescribed TOR (TOR proposed by the project proponent and additional TOR given by the MoEF) have been complied with and the data submitted is factually correct (Refer MoEF office memorandum dated 4th August, 2009).

(xiii) While submitting the EIA/EMP reports, the name of the experts associated with/involved in the preparation of these reports and the laboratories through which

the samples have been got analysed should be stated in the report. It shall clearly be indicated whether these laboratories are approved under the Environment (Protection) Act, 1986 and the rules made there under (Please refer MoEF office memorandum dated 4th August, 2009). The project Coordinator of the EIA study shall also be mentioned.

(xiv) All the TOR points as presented before EAC shall be covered.

6. A detailed draft EIA/EMP report shall be prepared in terms of the above additional TOR and should be submitted to the State Pollution Control Board for Public Hearing. Public Hearing to be conducted for the project in accordance with the provisions of Environmental Impact Assessment Notification, 2006 and the issues raised by the public should be addressed in the Environmental Management Plan. The Public Hearing shall be conducted based on the TOR letter issued by the Ministry and not on the basis of Minutes of the Meeting available on the website.

7. The project proponent shall submit the detailed final EIA/EMP report prepared as per TOR including issues raised during Public Hearing to the Ministry for considering the proposal for environmental clearance before expiry of validity of ToR.

8. The consultants involved in preparation of EIA/EMP report after accreditation with Quality Council of India/National Accreditation Board of Education and Training (QCI/NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other Organization(s)/Laboratories including their status of approvals etc. vide notification of the MoEF dated 19th July, 2013.

9. The prescribed TOR would be valid for a period of four years for submission of the EIA/EMP Reports.

10. This issues with the approval of Competent Authority.

(Amardeep Raju)
Scientist 'E'

Copy to:

1. Member secretary, Haryana State Pollution Control Board, C-11, Sector-6, Panchkula, Haryana.
2. Member secretary, Uttar Pradesh Pollution Control Board, Building.No. TC-12V, Vibhuti Khand, Gomti Nagar, Lucknow-226 010.
3. Addl. Principal Conservator of Forests (C), Ministry of Env., Forest and Climate Change, Regional Office (NZ), Bays No. 24-25, Sector 31 A, Dakshin Marg, Chandigarh - 160030.
4. Addl. Principal Chief Addl. Principal Chief Conservator of Forests (C), Ministry of Env., Forest and Climate Change, Regional Office (CZ), Kendriya Bhawan, 5th Floor, Sector "H" Aliganj, Lucknow - 226020 .

(Amardeep Raju)
Scientist 'E'

Draft EIA for the Construction of 6 lane Greenfield connectivity from DND-Faridabad-Ballabhgarh bypass (from km 32+600) to Jewar International Airport under Bharatmala Pariyojna (Lot-4/Pkg-1) in the State of Haryana and Uttar Pradesh. Proposed Length – 31.060 Km

ToR Reply

S.NO.	CONDITIONS	REPLY
	A. SPECIFIC CONDITIONS	
1.	Cumulative impact assessment study to be carried out along the entire stretch including the other packages and the current stretch under consideration.	The proposed project is stand-alone spur of six lane Greenfield to connect from DND-Faridabad-Ballabhgarh bypass (from km 32+600) to Jewar International Airport under Bharatmala Pariyojna it does not include any other sections for obtaining prior environment clearance. This ToR point has been amendment as per the observation of EAC minutes of meeting dated 30.11.2021 and accordingly complied in the DEIA report.
2.	The proponent shall carry out a detailed traffic flow study to assess inflow of traffic from adjoining areas like airport/urban cities. The detailed traffic planning studies shall include complete design, drawings and traffic circulation plans (taking into consideration integration with proposed alignment and other state roads etc.). Wherever required adequate connectivity in terms of VUP (vehicle underpass)/ PUP (Pedestrian underpass) needs to be included.	Details regarding traffic studies is given in **section 2.4 of Chapter 2** of the draft EIA report.

3.	Road safety audit (along with accident/black spot analysis) by any third party competent organization at all stages namely at detailed design stage, construction stage and pre-opening stage to ensure that the project road has been constructed considering all the elements of road safety.	Noted
4.	Provide compilation of road kill data on the wildlife on the existing road (national & state highways) in the vicinity of the proposed project. Provide measures to avoid road kill of wildlife by the way of road kill management plan.	Noted
5.	The alignment of road should be such that the cutting of trees is kept at bare minimum and for this the proponent shall obtain permission from the competent authorities. Alignment also should be such that it will avoid cutting old and large and heritage trees if any. All such trees should be geo-tagged, photographed and details be submitted in EIA-EMP report.	The alignment of road has been selected so as there is bare minimum of cutting of trees. The number of trees to be felled in is approx. 3000. The application for permission of the same is under process.
6.	The proponent shall carry out a comprehensive socio-economic assessment and also impact on biodiversity with emphasis on impact of ongoing land acquisition on the local people living around the proposed alignment. The Social Impact Assessment should have social indicators which can reflect on impact of acquisition on fertile land. The Social Impact Assessment shall take into consideration of key parameters like people's dependency on fertile agricultural land, socio-economic spectrum, impact of	Socio- Economic study and biodiversity environment has been discussed in **section 3.6 & 3.7 of Chapter 3** and its impact has been studied and given section **4.6 & 4.7 in Chapter 4** of the Draft EIA report.

Draft EIA for the Construction of 6 lane Greenfield connectivity from DND-Faridabad-Ballabhgarh bypass (from km 32+600) to Jewar International Airport under Bharatmala Pariyojna (Lot-4/Pkg-1) in the State of Haryana and Uttar Pradesh. Proposed Length – 31.060 Km

ToR Reply

	the project at local and regional levels.	
7.	As per the Ministry's Office Memorandum F. No. 22-65/2017-IA.III dated 30" September, 2020, the project proponent, based on the commitments made during the public hearing, shall include all the activities required to bc taken to fulfill these commitments in the Environment Management Plan along with cost estimates of these activities, in addition to the activities proposed as per recommendations of EIA Studies and the same shall be submitted to the Ministry as part of the EIA Report. The EMP shall be implemented at the project cost or any other funding source available with the project proponent.	Environment Management plan is given in **Chapter 9** of the draft EIA report.
8.	The Action Plan on the compliance of the recommendations of the CAG as per Ministry's Circular No. J-11013/71/2016-IA.I (M), dated 25th October, 2017 needs to be submitted at the time of appraisal of the project and included in the EIA/EMP Report.	Noted.
9.	Passage for animal movement has to be detailed in the report (if alignment is passing through Forest area).	
10.	A comprehensive plan for plantation of three rows of native species, as per IRC guidelines, shall be provided. Such plantation alongside of forest stretch will be over and above the compensatory	This ToR point has been amendment as per the observation of EAC minutes of meeting dated 30.11.2021 and

	afforestation. Tree species should be same as per the forest type.	accordingly complied in the DEIA report.
11.	Detailed Biodiversity assessment and conservation/mitigation plan be developed by a reputed institute or by a team of expert of national repute.	The proposed alignment neither passes through any national park, wildlife sanctuary conservation reserve nor falls within its Eco Sensitive Zone. The proposed project does not involve diversion of any forest land. DCF Haryana has informed that the said project does not involve diversion of any forest land. Hence, permission may be granted to carry out the Biodiversity assessment and conservation/mitigation plan by the expert of NABET accredited. This ToR point has been amendment as per the observation of EAC minutes of meeting dated 30.11.2021 and accordingly complied in the DEIA report.
	B. GENERAL CONDITIONS	
i.	A brief description of the project, project name, nature, size, its importance to the region/state and the country shall be submitted.	The proposed highway starts from Junction with Ballabhgarh Bypass near village Chandawali CH: 0+000 (District-Faridabad,

		Haryana) and terminating at Jewar International Airport near Ballabh Nagar Urf Karol Bangar village CH: 31+060 (District-Gautam Buddh Nagar, Uttar Pradesh) passing through districts Faridabad, Palwal & Gautam Buddh Nagar in the state of Haryana & Uttar-Pradesh. Scope of present report is confined to the (Ch. 0+000 to Ch. 31+060). The Proposed ROW of this section is taken as 60m in which all the configurations shall be fitted with. This is a green field alignment, and is proposed for 6-Lane. The proposed length of Project Highway is about 31.060 kms. The road passes through the districts of Faridabad, Palwal & Gautam Buddh Nagar through important villages/towns like Ballabhgarh, Mohna, Palwal, Jewar in the state of Haryana & Uttar-Pradesh.
ii.	In case the project involves diversion of forests land, guidelines under OM dated 20.03.2013 shall be followed and necessary action be taken accordingly,	There is no reserved and protected forest.

iii.	Details of any litigation(s) pending against the project and/or any directions or orders passed by any court of law/any statutory authority against the project to be detailed out.	No litigation(s) and/or any directions or order spassed by any court of law/any statutory authority against the project.
iv.	Detailed alignment plan, with details such as nature of terrain (plain, rolling, hilly), land use pattern, habitation, cropping pattern, forest area, environmentally sensitive areas, mangroves, notified industrial areas, sand dunes, sea, rivers, lakes, details of villages, tehsils, districts and states, latitude and longitude for important locations falling on the alignment by employing remote sensing techniques followed by "ground truthing" and also through secondary data sources shall be submitted.	The project site is characterized by mostly plain to undulating terrain. The land-use pattern of the project is mostly agricultural with patches of some settlements. The Land-use pattern of the project area is provided in **section 3.2.2 in Chapter 3**of draft EIA report. Proposed development does not involves any diversion of Forest areas. No Wildlife Sanctuary / National Park / Ecologically Protected Area (under Wildlife Protection Act, 1972) is located within 10 km radius from the project road. The location details of the project along with villages, tehsils and districts are provided in **section 2.2.4 of Chapter 2** of this report.
v.	Describe various alternatives considered, procedures and criteria adopted for selection of the final alternative with reasons.	3 different alternatives were considered for the project. Proposed alignment was found

		most suitable option in terms of Technical Freedom, Socio-Economic and Environment impact associated. The detailed analysis of Alternatives has been provided in **Chapter 5** of this report.
vi.	Land use map of the study area to a scale of 1: 25,000 based on recent satellite imagery delineating the crop lands (both single and double crop), agricultural plantations, fallow lands, waste lands, water bodies, built-up areas, forest area and other surface features such as railway tracks, ports, airports, roads, and major Industries etc. along with detailed ground survey map on 1:2000 scale showing the existing features falling within the right of way namely trees, structures including archaeological & religious, monuments etc. if any, shall be submitted.	The Land use map of the project is provided as ***Annexure A*** of this report.
vii.	If the proposed route is passing through any hilly area, the measures for ensuring stability of slopes and proposed measures to control soil erosion from embankment shall be examined and submitted.	The proposed project doesn't pass through any hilly area. The project stretch is not prone to any kind of landslide or rock-fall.
viii.	If the proposed route involves tunneling, the details of the tunnel and locations of tunneling with geological structural fraction should be provided. In case the road passes through a flood plain of a river, the details of micro-drainage, flood passages and information on flood periodicity at least of the last 50	No tunneling is involved in the project. The proposed project doesn't pass through the flood plain of any river. Bridges are proposed at all river crossings. Hence, no such study is required.

	years in the area shall be examined and submitted.	Also the rivers being crossed by the road are not flood prone.
ix.	If the project is passing through/located within the notified ecologically sensitive zone (ESZ) around a notified National Park/Wildlife Sanctuary or in the absence of notified ESZ, within 10 km from the boundary of notified National Park/Wildlife Sanctuary, the project proponent may simultaneously apply for the clearance for the standing committee of NBWL. The EC for such project would be subject to obtaining the clearance from the standing committee of NBWL.	The nearest Sanctuary is Asola Wildlife Sanctuary which is approx1 7.18 km from the project road which doesn't falls within 10 km boundary. 10 km buffer map is provided as ***Annexure B.***
x.	Study regarding the animal bypasses/underpasses etc. across the habitation areas shall be carried out. Adequate cattle passes for the movement of agriculture material shall be provided at the stretches passing through habitation areas. Underpasses shall be provided for the movement of Wild animals.	Total there are 01 Major Bridge, 01 Minor Bridge, 05 VUP, 17 LVUP, 09 flyovers, 01 Viaduct, 01 ROB, 57 Box culverts ; these passes will help in crossing of the animals in habitat areas. The details of the same have been provided as ***Annexure C.***
xi.	Study regarding in line with the recent guidelines prepared by Wildlife Institute of India for linear infrastructure with strong emphasis on animal movement and identifying crossing areas and mitigation measures to avoid wildlife mortality.	The details of the same will be provided in final EIA report.
xii.	The information shall be provided about the details of the trees to be cut including their species and whether it also involves any protected or endangered species.	The number of trees to be felled in is approx. 3000. The actual counting of trees in non-forest

	Measures taken to reduce the number of the trees to be removed should be explained in detail. The details of compensatory plantation shall be submitted. The possibilities of relocating the existing trees shall be explored.	area is in progress under the supervision of the Forest department. The details shall be furnished once finalized. Adequate nos. of trees shall be planted for every tree to be cut. Detailed budgeting shall be done in coordination with Forest Dept.
xiii.	Necessary green belt shall be provided on both sides of the highway with proper central verge and cost provision should be made for regular maintenance.	Adequate space has been left on both sides of the road for greenbelt development apart from the plantation at median.
xiv.	If the proposed route is passing through a city or town, with houses and human habitation on either side of the road, the necessity for provision of bypasses/diversions/under passes shall be examined and submitted. The proposal should also indicate the location of wayside amenities, which should include petrol stations/service centers, rest areas including public conveyance, etc.	All requisite measures have been taken in order to avoid any settlements. Major settlements through approx. 20 villages, the major settlements along the alignment are Ballabhgarh, Mohna, Palwal, Jewar in the state of Haryana and Uttar Pradesh have been successfully avoided by providing necessary curvatures. All way-side amenities have been provided in **section 2.3 of chapter 2** on the draft EIA report and in the Alignment plan.

xv.	Details about measures taken for the pedestrian safety and construction of underpasses and foot-over bridges along with flyovers and interchanges shall be submitted.	Various safety measures taken for pedestrians are provision of zebra crossings, refuge for pedestrians, traffic signals at intersections,direction boards and reflectors etc.
xvi.	The possibility that the proposed project will adversely affect road traffic in the surrounding areas (e.g. by causing increases in traffic congestion and traffic accidents) shall be addressed.	The proposed project is Greenfield in nature and shall reduce the traffic congestion on existing roads.
xvii.	The details of use of fly ash in the road construction, if the project road is located within the 100 km from the Thermal Power Plant shall be examined and submitted.	The proposed project stretch is about 15 Km from NTPC Thermal power plant. In compliance to Fly Ash Notifications S.O. 763(E) dated 14 Sept 1999, its amendment notification on S.O 979(E) dated 27 Aug 2003, notification S.O 2804(E) dated 3 Nov 2009 and amendment notification dated 25th January, 2016 by MoEF&CC, Fly ash shall be utilized in proposed road. **Fly Ash shall be used as:-** Embankments and backfills – Reinforced or unreinforced. Stabilization of sub grade, sub-base and base course.

Draft EIA for the Construction of 6 lane Greenfield connectivity from DND-Faridabad-Ballabhgarh bypass (from km 32+600) to Jewar International Airport under Bharatmala Pariyojna (Lot-4/Pkg-1) in the State of Haryana and Uttar Pradesh. Proposed Length – 31.060 Km

ToR Reply

		For replacing a part of OPC in Concrete pavements, paving blocks, kerb stones etc.
xviii.	The possibilities of utilizing debris/waste materials available in and around the project area shall be explored.	Possibilities shall be explored for utilization of waste material / construction debris from nearby construction sites. Debris generated from site leveling and digging shall be used for back filling of voids and stabilization of slopes.
xix.	The details on compliance with respect to Research Track Notification of Ministry of Road, Transport and Highways shall be submitted.	Complied
xx.	The details of sand quarry and borrow area as per OM No.2-30/2012-IA-III dated 18.12.2012 on 'Rationalization of procedure for Environmental Clearance for Highway Projects involving borrow areas for soil and earth" as modified vide OM of even No. dated 19""March 2013, shall be examined and submitted.	The details of sand quarry, borrow area andother materials are provided in **section 4.2.1 of chapter 4** of the EIA report.
xxi.	Climate and meteorology (max and min temperature, relative humidity, rainfall, frequency of tropical cyclones and snow fall); the nearest IMD meteorological station from which climatological data have been obtained to be indicated.	The nearest IMD station from the project stretch is Gurgaon. Climate and meteorology of Gurgaon observatory is provided in **section 3.4 of Chapter 3 of this report.**

xxii.	The air quality monitoring shall be carried out as per the notification issued on 16"November, 2009, Input data used for Noise and Air quality modelling shall be clearly delineated.	The air quality monitoring has been carried outas per the new notification issued on 16th November, 2009 and is given in **Section 3.4.1of Chapter 3** of this report.
xxiii.	The project activities during construction and operation phases, which will affect the noise levels and the potential for increased noise resulting from this project, shall be identified. Discuss the effect of noise levels on nearby habitations during the construction and operational phases of the proposed highway. Identify noise reduction measures and traffic management strategies to be deployed for reducing the negative impact if any. Prediction of noise levels shall be done by using mathematical modelling at different representative locations.	**Construction phase** Operation of DG sets, dozers, trucks and batching plants. **Operation phase** Plying of vehicles The mitigation measures for reducing the effects of the above are provided in section 4.3 of Chapter 4 of this report.
xxiv.	The impact during construction activities due to generation of fugitive dust from crusher units, air emissions from hot mix plants and vehicles used for transportation of materials and prediction of impact on ambient air quality using appropriate mathematical model, description of model, input requirement and reference of derivation, distribution of major pollutants and presentation in tabular form for easy interpretation shall be examined and carried out.	The impacts of the construction activities due to generation of fugitive dust are provided in **Chapter 4** of this report.
xxv.	The details about the protection to existing habitations from dust, noisc, odour etc. during	Measures for Dust and Noise controls arediscussed in

	construction stage shall be examined and submitted.	respective section of **Chapter 4.** IRCguidelines shall be followed for traffic safetywhile passing through the habitat.
xxvi.	If the proposed route involves cutting of earth, the details of area to be cut, depth of cut, locations, soil type, volume and quantity of earth and other materials to be removed with location of disposal/ dump sites along with necessary permission.	Cutting of earth is involved in this project. Site leveling to maintain the topography shall be undertaken.
xxvii.	If the proposed route is passing through low lying areas, details of filling materials and initial and final levels after filling above MSL shall be examined and submitted.	The project route doesn't pass through any low lying area.
xxviii.	The water bodies including the seasonal ones within the corridor of impacts along with their status, volumetric capacity, quality and likely impacts on them due to the project along with the mitigation measures shall be examined and submitted.	The details of all the water bodies along with their likely impacts and mitigation measures are provide in **section 4.4 of chapter 4** of draft EIA report.
xxix.	The details of water quantity required and source of water including water requirement during the construction stage with supporting data and also classification of ground water based on the CGWA classification, shall be examined and submitted.	The total water demand of the project is 9717 KL/day , which is inclusive for • Construction purpose. • Domestic consumption and utilities requirement. • Gardening/ green belt development. • Dust Suppression.

		As per CGWB, the ground water has been categorized as 'class C'.
xxx.	The details of measures taken during constructions of bridges across rivers/ canals/major or minor drains keeping in view the flooding of the rivers and the life span of the existing bridges shall be examined and submitted. Provision of speed breakers, safety signals, service lanes and foot paths shall be examined at appropriate locations throughout the proposed road to avoid accidents.	To avoid flooding of rivers and canals, the height of the bridge has been kept significantly more than the maximum level of water flow during monsoons. IRC guidelines shall be followed for traffic safety while passing through the habitat. The locations of all wayside amenities are provided in the strip plan and also in the **section 2.3 of Chapter 2** of this report.
xxxi.	If there will be any change in the drainage pattern after the proposed activity, details of changes shall be examined and submitted.	Sufficient nos. of culverts are provided tomaintain the natural drainage pattern of the area.
xxxii.	Rain water harvesting pit shall be at least 3 - 5 m above the highest ground water table. Provisions shall be made for oil and grease removal from surface runoff.	Rain water harvesting pits has been kept more than 5 mtrs above the highest ground water table.
xxxiii.	If there is a possibility that the construction/widening of road may cause an impact such as destruction of forest, poaching or reduction in wetland areas, examine the impact and submit details.	Project does not involvesany diversion of forest land. No poaching, reduction in wetland areas etc. are involved in the project.

Draft EIA for the Construction of 6 lane Greenfield connectivity from DND-Faridabad-Ballabhgarh bypass (from km 32+600) to Jewar International Airport under Bharatmala Pariyojna (Lot-4/Pkg-1) in the State of Haryana and Uttar Pradesh. Proposed Length – 31.060 Km

ToR Reply

xxxiv.	The details of road safety, signage, service roads, vehicular under passes, accident prone zones and the mitigation measures, shall be submitted.	Thc location of underpasses and other wayside amenities are provided in the **section 2.3 of Chapter 2** of this report. Its impacts and mitigation measures are discussed in **Chapter 4** of the report.
xxxv.	IRC guidelines shall be followed for widening &upgradation of roads.	Proposed project is a Greenfield alignment. Hence, not applicablc.
xxxvi.	The dctails of social impact assessment due to the proposed construction of the road shall be submitted.	Outcome of Social Impact Assessment is discussed in **Chapter 3** of the EIA report.
xxxvii.	Examine the road design standards, safety equipment specifications and Management System training to ensure that design details take account of safety concerns and submit the traffic management plan.	The traffic management plan along with existing traffic scenario and traffic forecast is provided in **Section 2.4 of Chapter 2** of this report.
xxxviii.	Accident data and geographic distribution shall be reviewed and analyzed to predict and identify trends-in case of expansion of the existing highway and provide Post accident emergency assistance and medical care to accident victims.	It is a new project. Hence, not required.
xxxix.	If the proposed project involves any land reclamation, details shall be provided of the activity for which land is to be reclaimed and the area of land to be reclaimed.	Noted

xl.	Details of the properties, houses, business activities etc likely to be effected by land acquisition and an estimation of their financial losses, shall be submitted.	The details have been provided in the section Social Environment of Chapter-3 & Chapter 4 of the report.
xli.	Detailed R&R plan with data on the existing socio-economic status of the population in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternative livelihood concerns/employment and rehabilitation of the displaced people, civil and housing amenities being offered, etc.; and the schedule of the implementation of the specific project, shall be submitted.	Noted
xlii.	The environment management and monitoring plan for construction and operation phases of the project shall be submitted. A copy of your corporate policy on environment management and sustainable development shall also be submitted.	Details of environmental management andmonitoring plan are discussed in Chapter 10 and Chapter 6 of this report respectively.
xliii.	Estimated cost of the project including that of environment management plan (both capital and recurring) and source of funding. Also, the mode of execution of the project, viz, EPC, BOT, etc, shall be submitted.	An amount of INR 10.80 lakhs has been earmarked for implementation of Environmental Management and monitoring plan.
xliv.	A copy of your CSR policy and plan for meeting the expenditure to address the issues raised during Public Hearing shall be submitted.	Will be complied.
xlv.	Details of blasting if any, methodology/technique adopted, applicable regulations/permissions, timing	No blasting is involved in this project.

	of blasting, mitigation measures proposed keeping in view mating season of wildlife.	
xlvi.	In case of river/creek crossing, details of the proposed bridges connecting on either banks, the design and traffic circulation at this junction with simulation studies.	The details of the proposed bridges areprovided as ***Annexure D.***
xlvii.	Details to ensure free flow of water in case the alignment passes through water bodies/river/streams etc.	Bridge / culvert (as the case may be) areproposed on water bodies. Hence, free flow of the water bodies shall not be affected.
xlviii.	In case of bye passes, the details of access control from the nearby habitation/habitation which may come up after the establishment of road.	Proposed project is Greenfield in nature.
xlix.	Bridge design in eco sensitive area /mountains be examined keeping in view the rock classification hydrology etc.	The proposed project stretch doesn't cross anyEco-sensitive area or mountains region.
l.	Dctails of litigation pending against the project, if any, with direction/order passed by any Court of Law against the Project should be given.	No litigation pending against the project
li.	The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.	Details of environmental management and monitoring plan are discussed in **Chapter 10 and Chapter 6** of this report respectively.
lii.	Any further clarification on carrying out the above studies including anticipated impacts due to the project and mitigative measure, project proponent can	Noted.

	refer tothe model ToR available on Ministry website "http://moef.nic.in/Manual/Highways".	

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CHAPTER 1 – INTRODUCTION

1.1 INTRODUCTION

Ministry of Road Transport and Highways, Government of India, has decided to improve the efficiency of freight movement in India. National Highways Authority of India (NHAI) has been entrusted for preparation of DPR to improve the road networks between Haryana and Uttar Pradesh. The proposed access controlled highway project with new alignment has been envisaged through an area which shall have the advantage of simultaneous development as well as shall result in a shorter distance to travel. The junctions with existing road will be planned in the form of interchanges and flyover to ensure uninterrupted flow of traffic.

The proposed road would act as connecting highway between Delhi-Mumbai expressways to Jewar Airport. It will enhance economic development, provide employment opportunities to locals, strengthen tourist development, ensure road safety, and provide better transportation facilities. Vehicle operating cost will also be reduced due to improved road quality. The compensatory plantation and road side plantation shall further improve the air quality of the region.

SA infrastructure Consultant Pvt. Ltd. 1101A, 11th Floor, Tower A-II, Corporate Park, Plot no. 7A/1, Sector 142, Noida, U.P has been appointed as consultant to carry out consultancy services for the for preparation of DPR and P & M Solution, C-88, Sector 65, Noida, U.P has been appointed as Environment consultant to carry out consultancy service for Environment Impact Assessment (EIA) report.

The proposed highway starts from Junction with Ballabhgarh Bypass near village Chandawali CH: 0+000 (District-Faridabad, Haryana) and terminating at Jewar International Airport near Ballabh Nagar Urf Karol Bangar village CH: 31+060 (District- Gautam Buddh Nagar, Uttar Pradesh) passing through districts Faridabad, Palwal & Gautam Buddh Nagar in the state of Haryana & Uttar-Pradesh. Scope of present report is confined to the (Ch. 0+000 to Ch. 31+060). The Proposed ROW of this section is taken as 60m in which all the configurations shall be fitted with. This is a green field alignment, and is proposed for 6-Lane. The proposed length of Project Highway is about 31.060 kms. The road passes through the districts of Faridabad, Palwal & Gautam Buddh Nagar through important villages/towns like Ballabhgarh, Mohna, Palwal, Jewar in the state of Haryana & Uttar-Pradesh.

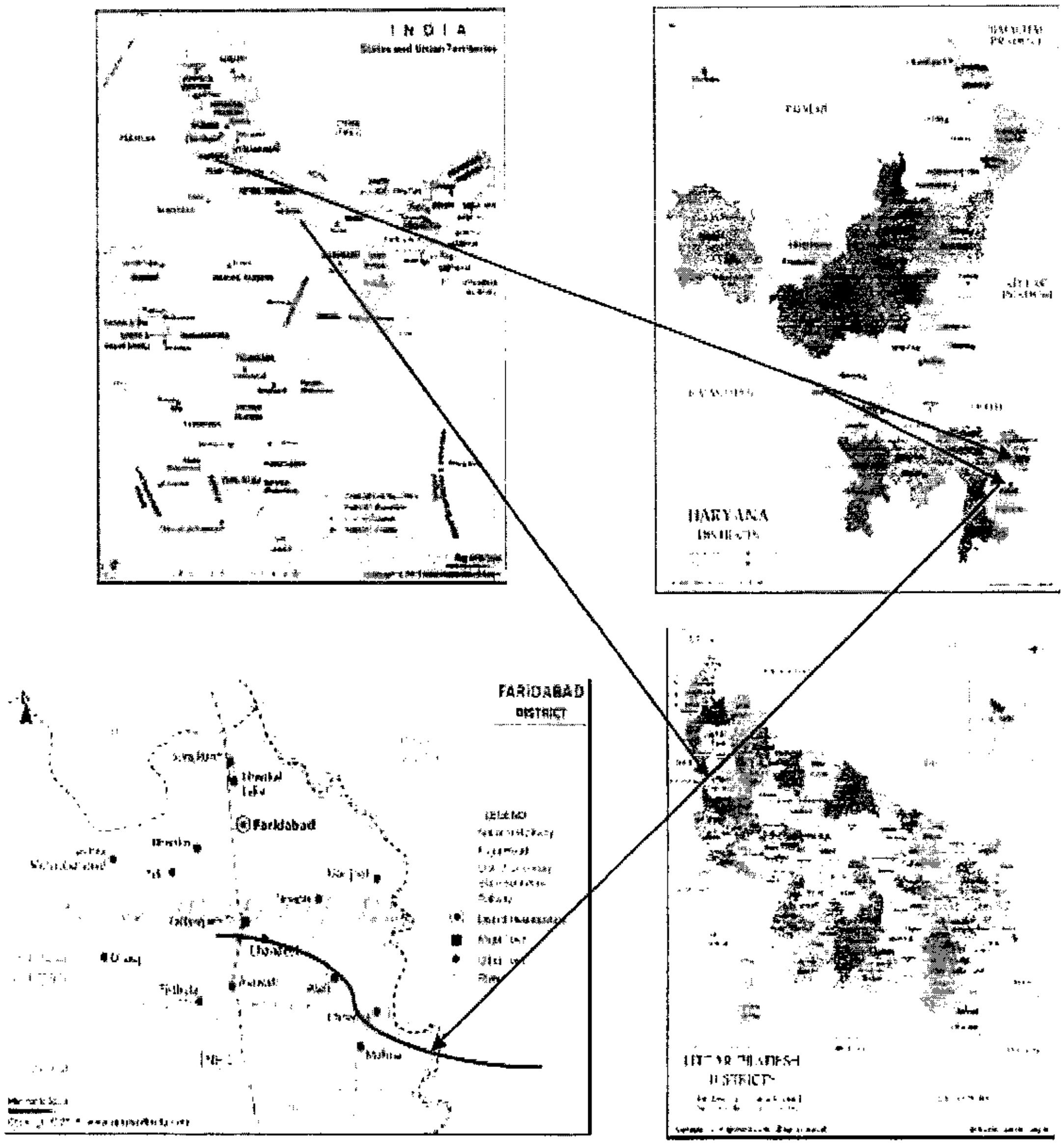

Figure 1.1: Project Location Map

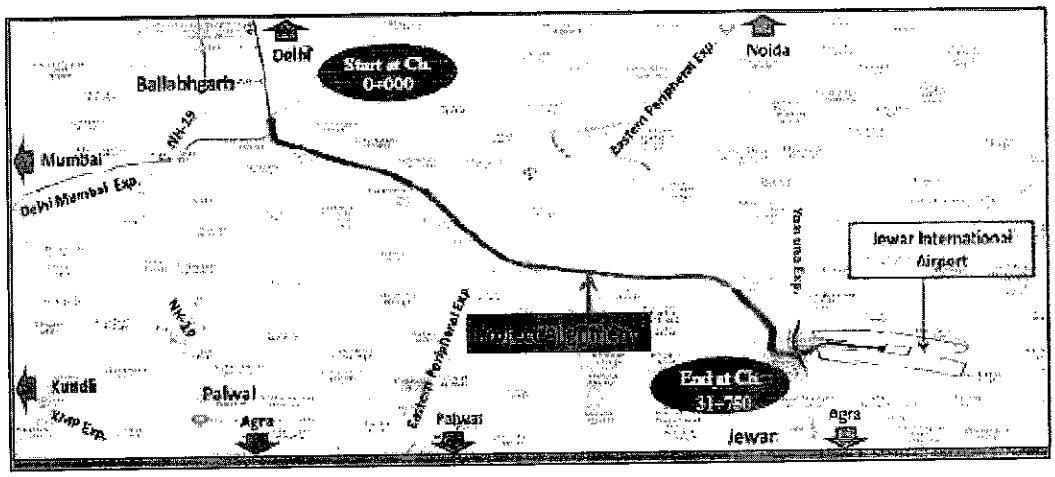

Figure 1.2: Key map of the project Alignment

1.2 PURPOSE OF THE REPORT

The purpose of this Environmental Impact Assessment (EIA) is to incorporate environmental concerns at the project level. EIA has been carried out at the project planning and design stage as part of Preliminary report to ensure that the project is environmentally feasible. The general objectives of EIA study are as follows:

i. to provide information about the general environmental settings of the project area as baseline data;
ii. to provide information on potential impacts of the project and the characteristic of the impacts, magnitude, distribution, the affected group and their duration;
iii. to provide information on potential mitigation measures to minimize the impact including mitigation costs;
iv. to assess the best alternative project at most benefits and least costs in terms of financial, social and environment; and
v. to provide basic information for formulating management and monitoring plan.

The EIA has been prepared as the projects are likely to have moderate to minor impacts. This EIA is in accordance with the requirements of the MoEF&CC.

1.3 SCOPE OF EIA STUDY

The scope of the EIA includes the following:

i. To carry out Environment Impact Study including Environmental Impact Assessment (EIA) in accordance with MoEF&CC & State Government of Haryana guidelines;

ii. To carry out the preliminary environmental screening to assess the direct and induced impacts due to the project works;

iii. To assess and document baseline conditions relevant to the project with the objective to establish the benchmarks;

iv. To assess the potential positive and negative significant impacts due to the project and identify the cost effective mitigation measures to address these impacts adequately in the Environmental Monitoring and Management Plan (EMMP);

v. To do the analysis of alternatives incorporating environmental concerns and the associated costs in the economic analysis.

vi. To give special attention to the environmental enhancement measures in the projects for the following: Tree plantation along the project road; Cultural property enhancement along the project roads; Bus bays including a review of their location;

vii. Traffic safety provisions like Guard post, Road Delineators, Metal Beam Crash Barrier along the Project roads, depending upon the site requirements, and

viii. Re-development of the borrow, quarry areas located on public land.

ix. To prepare EIA report adequate public consultation and the recommendations arising thereon.

x. To provide additional inputs in the areas of performance indicators and monitoring mechanisms for environmental components during construction and operational phase of the project.

xi. To provide the cost of mitigation measures and to ensure that environmental related staffing, training and institutional requirements are budgeted in project cost.

The objective of this EIA study is to identify potential environmental impacts of the Proposed Highway and formulate strategies to avoid / mitigate the same. The scope of work to accomplish the above objective, comprise the following.

- Understanding the baseline environmental conditions of the project area,
- Identifying the potential environmental impacts of the project proposal,
- Recommendation of appropriate mitigation measures to avoid / minimise the environmental impacts, and
- Preparing an environmental management plan for the Proposed Highway.

1.4 METHODOLOGY

The methodology used for this study is based on the procedures described in MoEF&CC Environmental Impact Assessment Notification dated 14th September 2006 and amendments therein.

The Environmental Impact Assessment has been carried out using current Government of India guidelines, specifically:

- Project Terms of Reference (TOR);
- Environmental Impact Assessment Notification dated 14thSeptember 2006, Ministry of Environment and Forest (MoEF&CC) and amendment, Government of India;
- The Environmental (Protection) Act, 1986 of Government of India;
- Environmental guidelines for Road/Rail/Highway Projects, 1989, Government of India;
- Handbook of environmental procedures and guidelines, 1994, Government of India; and
- Guidelines for Environmental Impact Assessment of Highway Projects (IRC: 104-1988).

1.5 DATA COLLECTION

Data was collected on various environmental components such as soil, meteorology, geology, hydrology, water quality, flora and fauna, habitat, demography, land use, cultural properties etc, to establish the baseline environmental setup. Secondary data on environment for the project corridor was collected both from published and other relevant sources e.g., the State Department of Forest, State Pollution Control Board, State Statistical Department etc. The data collection from the field was completed with the help of field surveyors and enumerators/investigators. The interviewers/surveyors were trained for taking the samples and filling up the Questionnaires at site. To ensure the accuracy of the data it was collected under the supervision of the consultant.

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CHAPTER 2 – PROJECT DESCRIPTION

2.1 IMPORTANCE OF PROJECT ROAD

The proposed highway starts from Junction with Ballabhgarh Bypass near village Chandawali CH: 0+000 (District-Faridabad, Haryana) and terminating at Jewar International Airport near Ballabh Nagar Urf Karol Bangar village CH: 31+060 (District- Gautam Buddh Nagar, Uttar Pradesh) passing through districts Faridabad, Palwal & Gautam Buddh Nagar in the state of Haryana & Uttar-Pradesh.

Scope of present report is confined to the (Ch. 0+000 to Ch. 31+060).

The Proposed ROW of this section is taken as 60m in which all the configurations shall be fitted with. This is a green field alignment, and is proposed for 6-Lane. The proposed length of Project Highway is about 31.060 kms.

The road passes through the districts of Faridabad, Palwal & Gautam Buddh Nagar through important villages/towns like Ballabhgarh, Mohna, Palwal, Jewar in the state of Haryana & Uttar-Pradesh.

2.1.1 Existing carriage away and pavement detail

This is a completely new proposed Green Field Alignment where there is no existing road. This road is proposed to divert the long route traffic, The whole section is proposed to be of Flexible Pavement type confirming to IRC: 37:2018. Rigid pavement shall be constructed in the section(s) for Toll Plaza only. The configuration of the carriageway shall confirm to IRC: SP: 84:2019 and the Structures shall be constructed as 6 lane configurations.

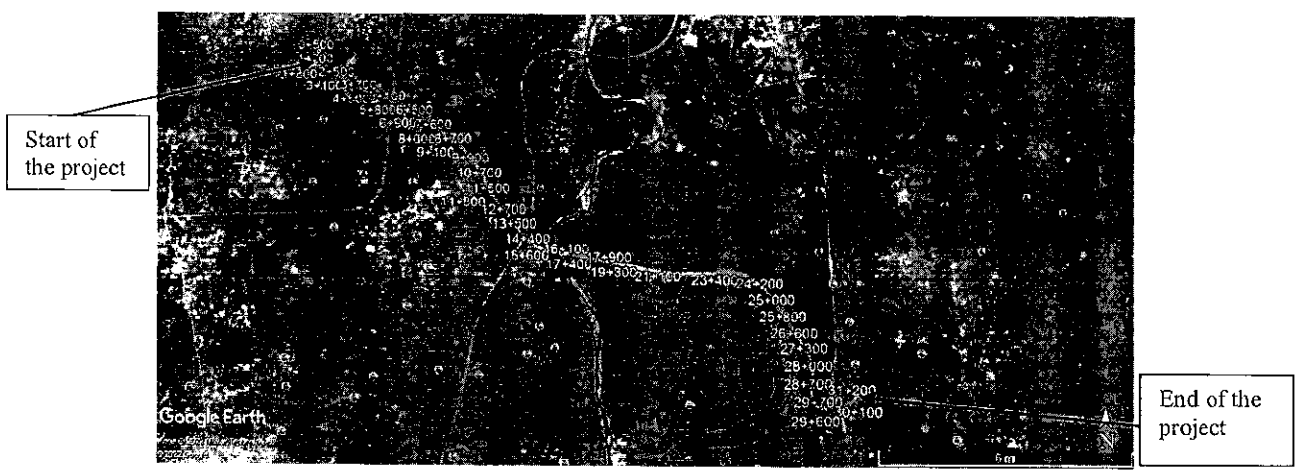

Figure 2.1: Shows the start point & end of the project road

2.2 LOCATION & PROJECT DETAIL

2.2.1 Location of Project Road

This project road is located geographically in the Faridabad, Palwal & Gautam Buddh Nagar district in the state of Haryana & Uttar Pradesh.

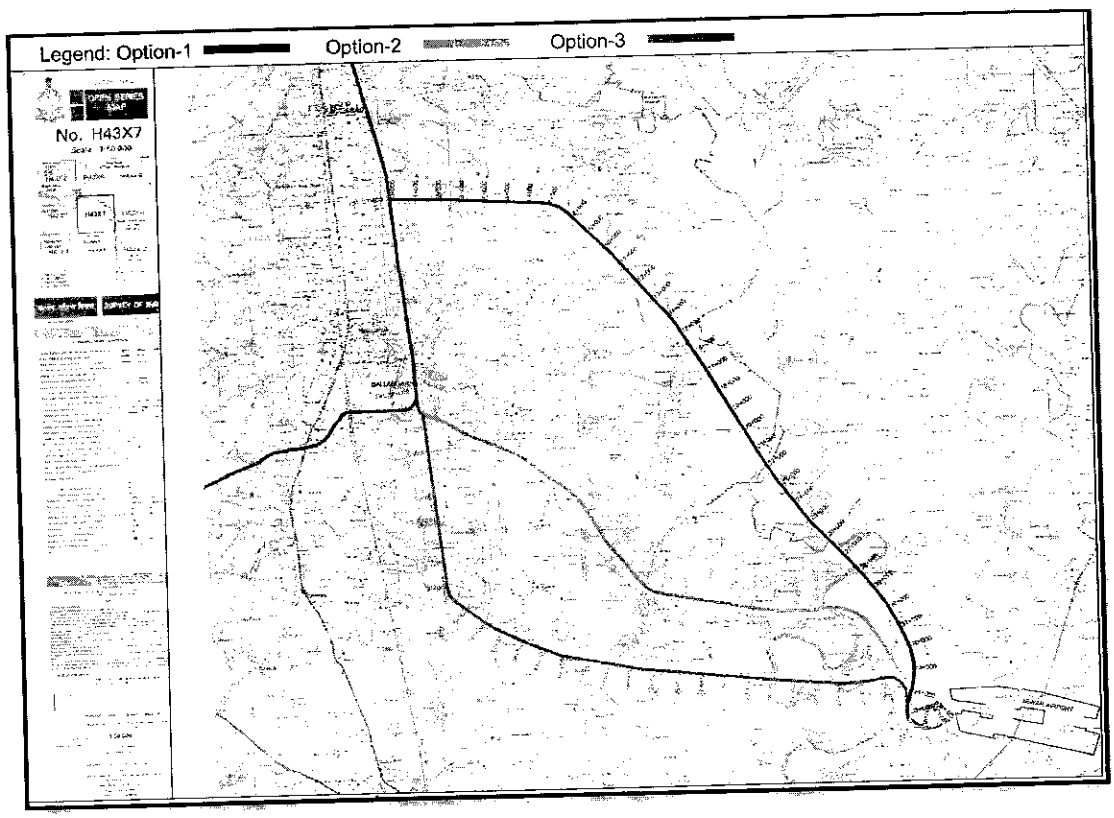

Figure 2.2: Shows the location of the project road marked on Toposheet

2.2.2 The Project Area

The project area is mainly passes through the village settlement and urban patches on a plain terrain.

2.2.3 Land use and Settlements along Project Road

The existing land use around the proposed project primarily comprises of agricultural land both under private and government ownership, land for cattle grazing, The project alignment passes through approx. 20 villages, the major settlements along the alignment are Ballabhgarh, Mohna, Palwal, Jewar

Table 2.1: Land Use

S.No.	Land use/Landover	Area (ha)	Percentage %	Remarks if any
1.	Private land	200	89.11	Agriculture/Barren Land
2.	Government land	20.435	9.10	Agriculture/Barren Land
3.	Forest land	4	1.79	-
	Total	**224.435**	**100**	-

2.2.4 List of Towns and Villages along project road

There are total about 20 major villages/towns along the Project Highway, in which most of the settlements are ribbon developed.

Tehsil- Ballabhgarh, Mohna, Palwal, Jewar.

Villages - Chandawali, Shahupura, Sotai, Behbalpur, Phophunda

Sub-tehsil-Mohna: Panehra Khurd, Narhawali, Mahmadpur, Hirapur, Mohna, Mohiyapur, Chhainsa.

Villages – Bagpur Kalan, Jhuppa.

Village – Falaida Khadar, Falaida Bangar, Karauli Bangar, Dayanat Pur, Ballabh Nagar Urf Karol Bangar.

Table 2.2: Important Villages/Towns along Project Highway

Sl. No.	Existing Location		Name of Village/ Town
	From (km)	To (km)	
1	0+000	15+000	Ballabhgarh, Mohna
2	15+000	22+300	Palwal
3	22+300	31+060	Bassi
4	54+300	66+900	Jamwa Ramgarh

2.2.5 Terrain

The terrain of the alignment area is mainly plain and rolling area.

2.2.6 Road Section and Pavement

The carriageway of the Project Highway is generally of 6-lane configuration.

2.2.7 Alignment

The present road alignment is linear throughout except at few locations, where alignment needs geometric improvements. The carriageway of the Project Highway is generally of 6-lane.

2.2.8 Right-of-way

The Proposed Right of Way is 60 m as per the requirement keeping in view the fully access controlled Highway with 6-lane dual carriageway configuration.

2.2.9 Road Junctions

There are 4 major intersections. The junctions will be improved as per the scenario by their category. The junction details are given below in Table 2.3.

Table 2.3: List of Major intersections

S.No.	Design Chainage	Type	Classification	Connecting Road	Remarks
1	0+000	3-Leg Directional	Major	Faridabad Bypass Road	Faridabad/DND
2	13+983	Full Clover Leaf	Major	EPE	Palwal/Sonipat
3	23+804	Flyover with at Grade Round about	Major	ODR	Baghpur/Falaida
4	30+226	Full Clover Leaf	Major	Yamuna Expressway	Agra/Greater Noida

2.3 STRUCTURES DETAILS

The proposed alignment from Faridabad to Jewar, Gautam Budh Nagar mainly traverses through Plain terrain. As this is a completely new proposed Green Field Alignment, it passes through many rivers and canals. There are several structures along the project road. Various structures have been proposed. According to the settlements, hydrology data, and convenience of traffic movements. Total there are 01 Major Bridge, 01 Minor Bridge, 05 VUP, 17 LVUP, 09 flyovers, 01 Viaduct, 01 ROB, 57 Box culverts. The details are given below in table Format. The detailed list of the structures is provided in ***Annexure C & D***.

2.3.1 Major & Minor Bridges:

Table 2.4: Details of Major Bridge

S. No	Design Ch.	Proposed Span	Deck Configuration (m)	Super & sub structure type	Remarks
1	15+571	12x 60	2 x 14.5	Segmental Box Girder	Yamuna River

Table 2.5: Details of Minor Bridge

S.No.	Design Ch.	Proposed Span	Carriageway	Super & sub structure type
1	22+220	1 x 25	2 x 14.5	PSC I Girder + Pile Foundation

2.3.2 Fly-Over/Interchange

At the starting of the Project road, a Trumpet Interchange has been proposed followed with Fly-Overs which are crossing the National/State Highways. The details are given below:

Table 2.6: Details of Fly-Over

S.No	Design Ch.	Intersecting Road	Proposed Span	Carriageway	Super & sub structure type
1	3+660	Sector road	2 x 30	2 x 14.5	PSC I Girder & RCC slab
2	6+850	Sector road	2 x 30	2 x 14.5	PSC I Girder & RCC slab
3	8+250	Sector road	2 x 30	2 x 14.5	PSC I Girder & RCC slab
4	9+530	Sector road	2 x 30	2 x 14.5	PSC I Girder & RCC slab
5	13+983	Eastern Peripheral	1x30+2x50+1x30	2x18.00	PSC & Steel composite Girder & RCC slab

		Expressway			
6	23+804	ODR	3x30	2x14.5	PSC I Girder & RCC slab
7	24+700	Sector road	2x25	2x14.5	PSC I Girder & RCC slab
8	29+300	Sector road	2x25	2x14.5	PSC I Girder & RCC slab
9	30+226	Yamuna Expressway	1x30+2x50+1x30	2x21.25	PSC & Steel composite Girder & RCC slab

2.3.3 Road Over Bridge

There is 01 number of R.O.B Proposed in this section. All the lanes shall be equipped as ETC Lanes whose details are given below:

Table 2.7: Details of R.O.B

S.No	Design Ch.	Structure Type	Proposed Span
1	5+261	PSC I Girder+RCC Slab and Bow string (RDSO)	4x30+1x95+5x30

2.3.4 Details of Toll Plaza

Proposed Toll Plaza at main carriageway details are given below:

Table 2.8: Details of Toll Plaza

S.No.	Main Carriageway Chainage (in km.)	Toll Plaza	No. of toll lanes (Fastag/e.t.c + Extra Wide)
1	04+240	MCTP-1	(14+2)
2	25+960	MCTP-2	(14+2)

2.3.5 Hospitals, Schools and Police Stations

There are number of schools, collages, hospitals and police stations, along the 1 km of the project road both side.

2.4 TRAFFIC PROJECTION

Following Various types of traffic surveys were carried out

1. Classified Volume Count (CVC) Survey
2. Origin-Destination and commodity movement surveys
3. Axle load spectrum survey
4. Speed and Delays survey
5. Pedestrian/cattle crossing surveys
6. Truck terminal surveys

- The proposed highway starts from Junction with Ballabhgarh Bypass near village Chandawali (District-Faridabad, Haryana) and terminating at Jewar International Airport near Ballabh Nagar Urf Karol Bangar village (District- Gautam Buddh Nagar, Uttar Pradesh). CH: 0+000 to 31+060.
  Ballabhgarh Bypass near village Chandawali (District-Faridabad, Haryana),
- Terminating at Jewar International Airport near Ballabh Nagar Urf Karol Bangar village (District- Gautam Buddh Nagar, Uttar Pradesh)
- The proposed road passes through 3 districts viz. Gautam Buddh Nagar, Faridabad & Palwal in the state of Uttar Pradesh & Haryana.

Figure 2.3: Project stretch and interchanges

2.4.1 PCU

The Passenger Car Unit (PCU) recommended by IRC: 64-1990 and adopted values have been used for analysis. These values are given in **Table 2.9.**

Table 2.9: PCU Factors

Type of Vehicle	PCU Factor	Type of Vehicle	PCU Factor
Two-Wheeler	0.5	Truck Trailer /Multi- Axle	4.5
Auto Rickshaw	1	Agriculture Tractor-trailer	4.5
Car / Jeep / Van	1	Animal Drawn	8
Mini Bus	1.5	Cycle	0.5
Standard Bus	3	Hand Cart	3
LCV/Agriculture Tractor	1.5	Cycle Rickshaw	2
2- Axle	3	3- Axle	3

2.4.2 Average daily traffic (ADT)

Traffic volume count data for seven days at each of the locations were averaged to determine Average Daily Traffic (ADT) by IHMCL (year 2019). The traffic is projected for the base year 2021 using growth rate @5%. The survey location ADT by vehicle type is presented in Table 2.10.

Table 2.10: Location of 7 days classified Traffic volume count

NH	NH48	NH-48	NH-21
Location	Shahjahanpur	Thikariya	Rajadhok
Bicycle	47	35	37
2 Wheeler	15505	10487	12646
3 Wheeler	534	347	439
Tractor	38	17	36
Tractor with Trailer	207	158	154
SCV	1938	1783	303
Cars	18535	12917	10696
LCV	6144	2675	1514

2 Axle Trucks & Buses	2905	2972	2367
3 Axle Trucks & Buses	5525	3390	572
MAV	11482	9154	1853
Cycle Rickshaw	1	1	1
Average Daily Traffic No.	62865	43942	30620
Average Daily Traffic PCU	115966	85367	37959

Maximum traffic has been observed at Shahjahanpur Toll Plaza along NH-48, followed by Rajadhok Toll Plaza (NH-21).

2.5 TYPICAL CROSS-SECTIONAL DRAWING

There are 09 nos. of TCS that have been used in this stretch. The details of the TCS schedule is provided in Fig 2.4(a) to fig 2.4(f) from Design Ch. 00+000 Km to Design Ch. 31+060 Km.

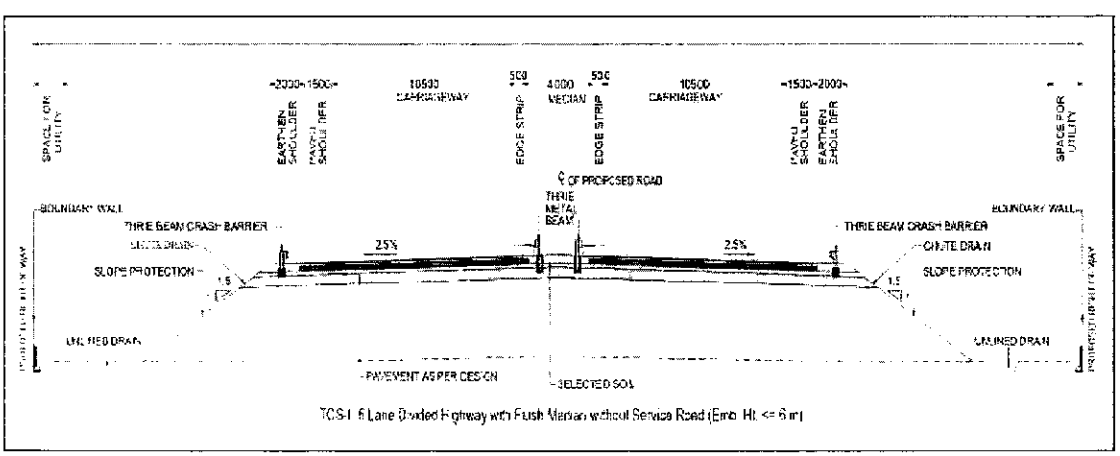

Fig 2.4(a) Typical Cross Section 1

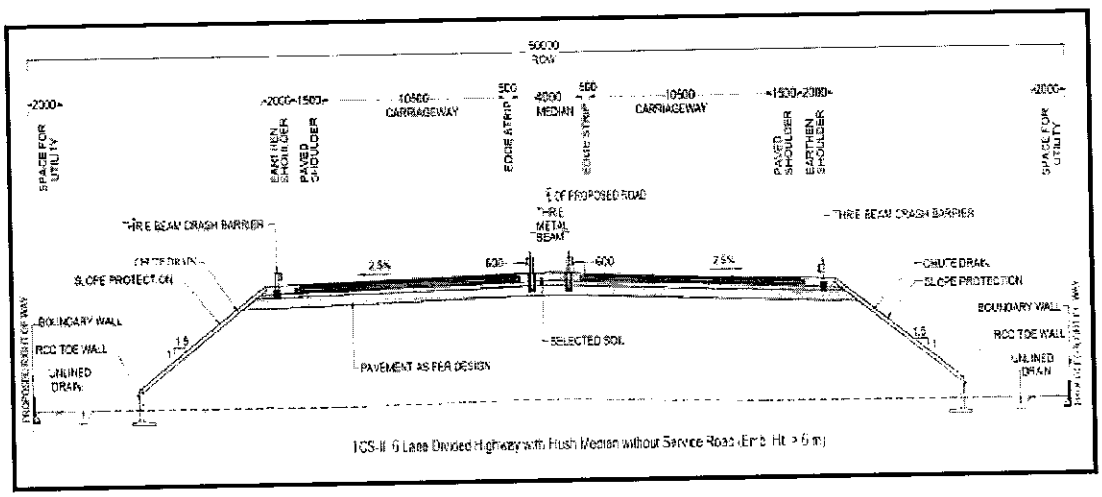

Fig 2.4(b) Typical Cross Section 2

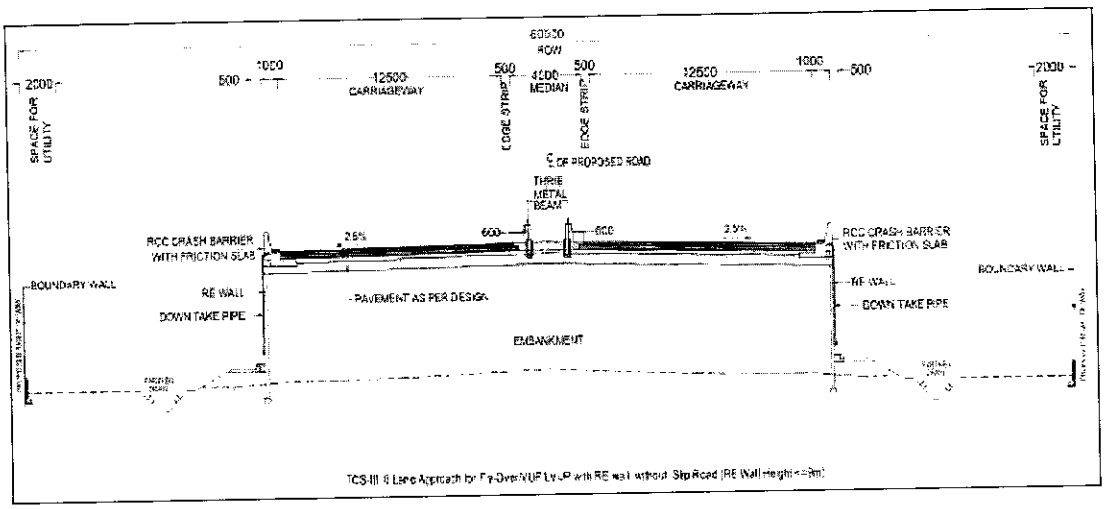

Figure 2.4(c) Typical Cross Section 3

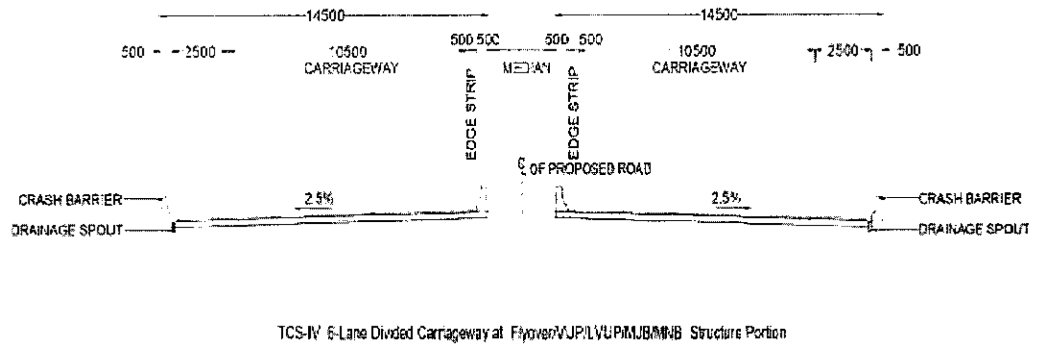

Figure 2.4(d): Typical Cross Section 4

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CHAPTER 3: ENVIRONMENTAL AND SOCIAL BASELINE SETTINGS

3.1 INTRODUCTION

The main objective of describing the environment which may be potentially affected, are i) To assess present environmental quality and the environmental impacts and ii) to identify environmentally significant factors that could preclude development. Construction activities affect the existing status of environment at site. In order to maintain the existing environmental status at construction site it is essential study existing environmental status and assess the impact of upcoming project on various environmental components.

This Chapter gives idea of description of environment status of the study area and this will be helpful for assessment of impact on the environment due to proposed construction activities.

Baseline environmental status in and around proposed construction describe the existing conditions of air, noise, water, soil, biological and socio-economic environment. The proposed project as a strip, a radial distance of 10 km is considered as study area for baseline data collection and environmental monitoring. The data was collected by P & M Solution and its associated laboratories for various environmental attributes so as to compute the impacts that are likely to arise due to proposed development activity.

3.1.1 Study Area & Study Period

The proposed project as a strip, a distance of 10 km within the strip is considered as study area for baseline data collection and environmental monitoring. This area is referred to as study area/ project area in the report. It includes environmental features such as forest areas, conservation areas, water bodies (rivers, lakes ponds and reservoirs), industries, wildlife/National parks and, places of historical importance, tourism etc. The baseline environment quality was carried out over a radial distance of 10 km around the site during month of October 2021 to December 2021. 10 km buffer map is attached as ***Annexure B.***

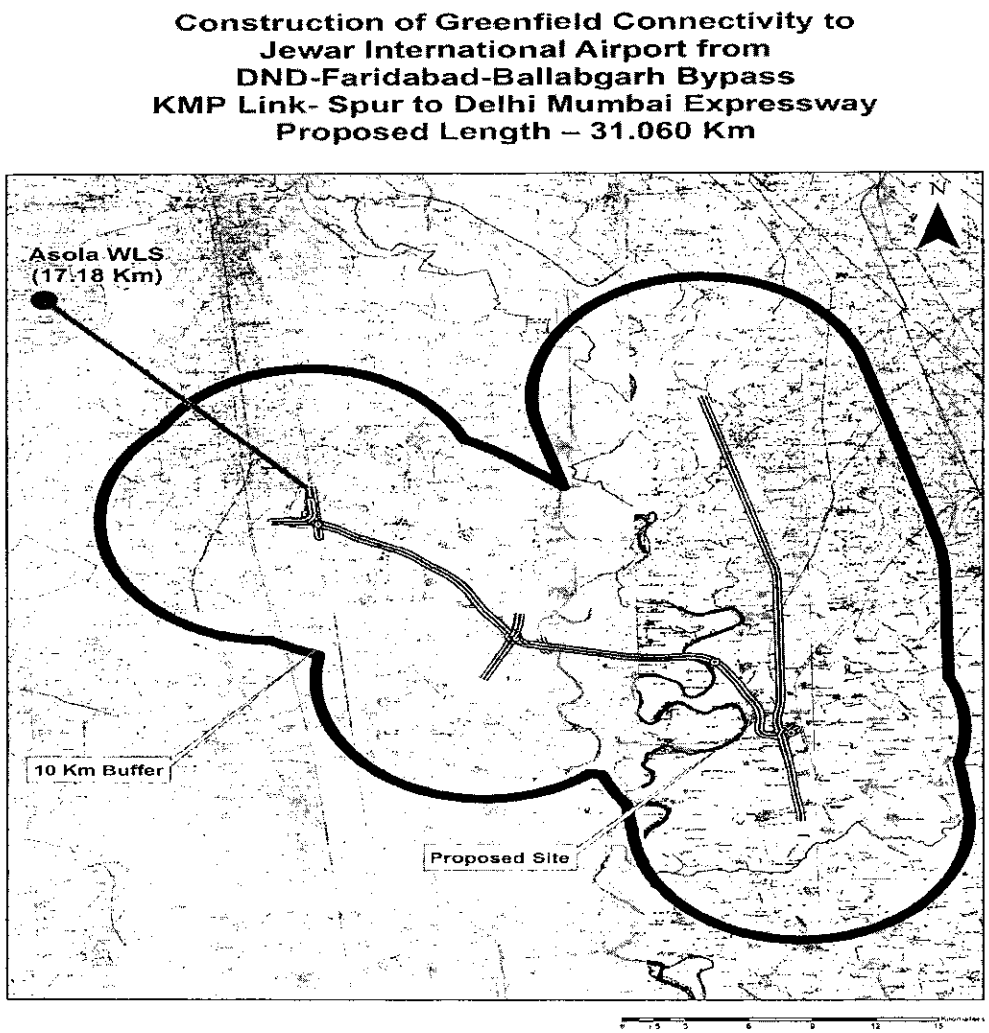


Figure 3.1: Shows 10 km radius of the project area.

3.1.2 Secondary Available Data

The secondary data were collected from following sources has been presented in Table 3.1:

Table 3.1: Secondary data Sources

1.	Meteorological data	Indian Meteorological Department
2.	Statistical data	District Statistical Office
3.	Irrigation and hydrogeology data	Central Ground Water Board
4.	General Land use and Cropping Pattern	Agriculture Department

5.	Relief and slope	Survey of India
6.	Rocks and minerals	Geological Survey of India
7.	Industries	District Industries Centre
8.	Maps and Topo sheets	Survey of India
9.	Forest Types, Wild life and Bio-diversity	State Forest Department, Government of Haryana
10.	Archaeological Data	Archaeological Survey of India

3.2 PHYSICAL ENVIRONMENTAL SETTINGS

3.2.1 Geography

3.2.1.1 Boundaries and Area:

Faridabad District: Haryana located on southeastern part of Haryana. In the north, it is bordered by the Union Territory of Delhi in the east by Uttar Pradesh, in the North West by Mewat Gurgaon districts of Haryana and in the west. Total geographical area of the district is 2151 sq. km.

Palwal District: Palwal district of Haryana. Total geographical area of the district is 1364.55 sq.km. Administratively, Palwal is the district Headquarter of the district. It is divided into 4 development blocks namely Palwal, Hathin, Hodal and Hasanpur. The district area is bounded on western side Mewet district, Eastern side by U.P. state and northern side by Faridabad district.

Gautam Budh Nagar District: Gautam Budh Nagar district with geographical area of 1442 Sq. Km with headquarters at industrial city of Greater Noida has three Tehsils and four developmental blocks viz. Bisrakh, Dadri, and Dankaur & Jewar.

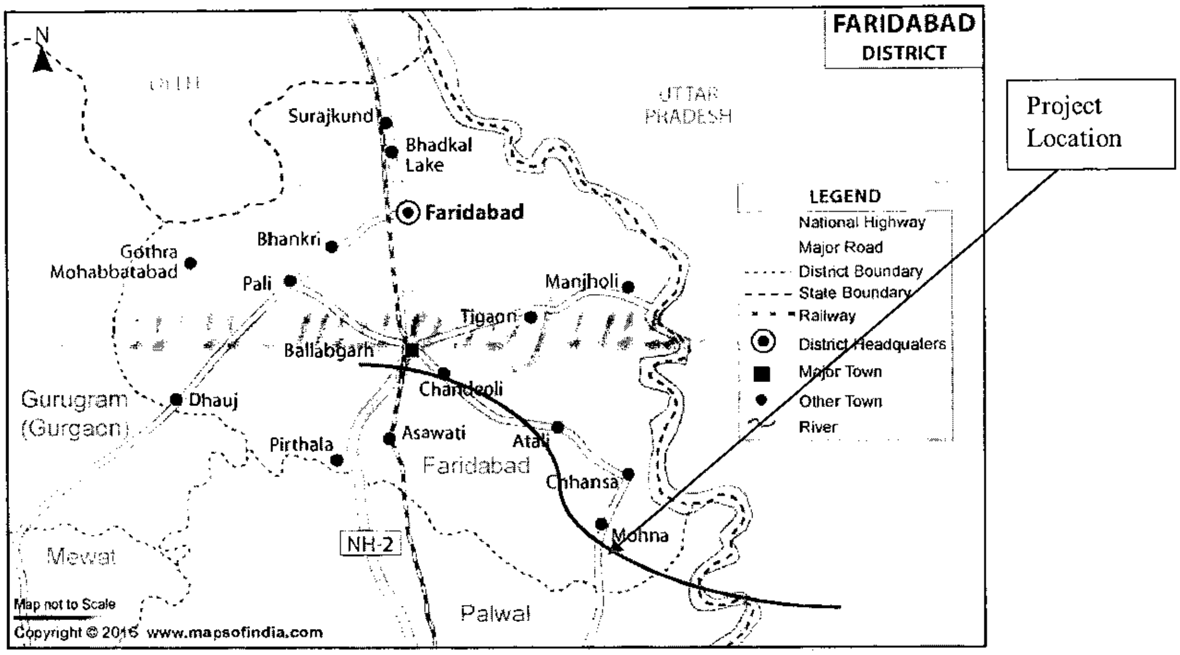


Figure 3.2: Location Map

3.2.1.2 Geographical Location of the project highway

The proposed highway starts from Junction with Ballabhgarh Bypass near village Chandawali CH: 0+000 (District-Faridabad, Haryana) and terminating at Jewar International Airport near Ballabh Nagar Urf Karol Bangar village CH: 31+060 (District- Gautam Buddh Nagar, Uttar Pradesh) passing through districts Faridabad, Palwal & Gautam Buddh Nagar in the state of Haryana & Uttar-Pradesh.

Scope of present report is confined to the (Ch. 0+000 to Ch. 31+060).

The Proposed ROW of this section is taken as 60m in which all the configurations shall be fitted with. This is a green field alignment, and is proposed for 6-Lane. The proposed length of Project Highway is about 31.060 kms.

The road passes through the districts of Faridabad, Palwal & Gautam Buddh Nagar through important villages/towns like Ballabhgarh, Mohna, Palwal, Jewar in the state of Haryana & Uttar-Pradesh.

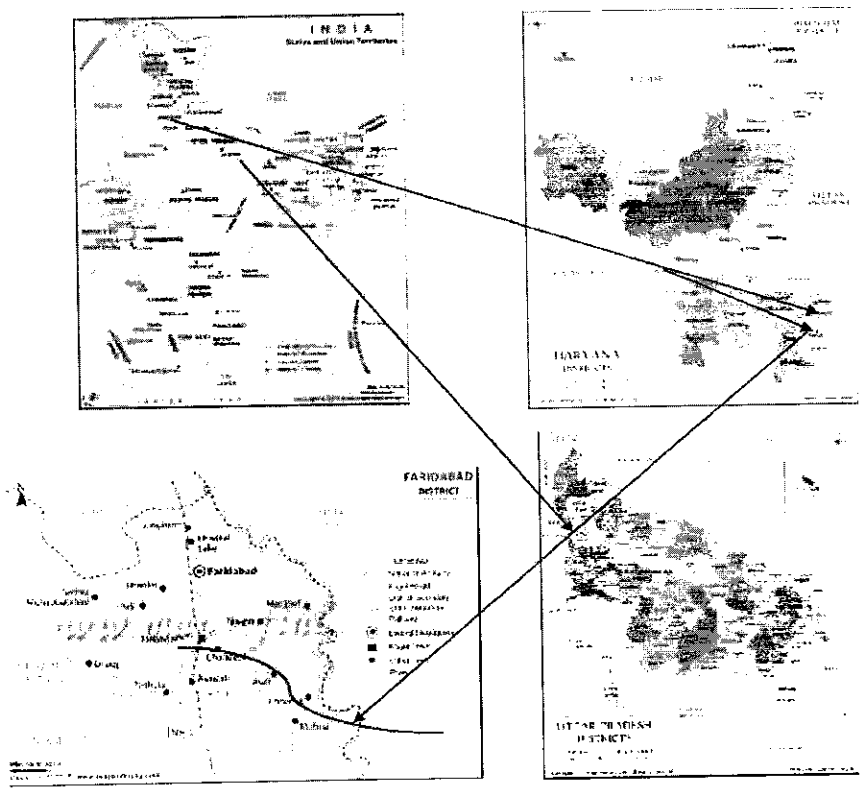


Figure 3.3: Location of project Alignment

3.2.1.3 Basins & Rivers:

Faridabad District: The major river is Yamuna which is a perennial river.

Palwal District: The district is occupied by Indo-Gangetic alluvial plain of Quaternary age, and falls in Yamuna sub -basin of Ganga basin.

Gautam Budh Nagar District: The district falls in Yamuna Sub-basin and forms a part of Ganga Yamuna Doab. Major part of the district is covered by Hindon river water shed.

The Project alignment passes through following rivers:

Table 3.2: List of water bodies

S.No.	Design Chainage	Name of Type of water bodies
1	15+571	Jair Nala
2	22+220	Yamuna River
3	27+923	Irrigation Canal

3.2.1.4 Drainage:

Faridabad District: The district is mainly drained by the rivers Yamuna, which is a perennial besides this a number of small streams originates from the hill ranges of the central parts of the district, which do not meet any major stream OR Rivers but disappears in the permeable deposits of alluvial plains after traversing some distance. The drainage of the area is dendritic sub parallel to sub-angular pattern.

Palwal District: There vare two main canals Agra canal and Gurgaon canal which passes through western and central part of the district respectively from north to south.In the northeren part of the district Budia nala is flowing from east to west and discharges its rainy water in river Yamuna. The Gaunchi main drain passes through north south direction of the district running in between Agra canal and Gurgaon canal.

Gautam Budh Nagar District: District of Gautam Budh Nagar is drained by river Yamuna and its tributaries namely- Hindon River and Bhuriya nadi. All these drainage ways flow in a southerly or southeasterly course. These streams generally follow a meandering course through a narrow flood plains.

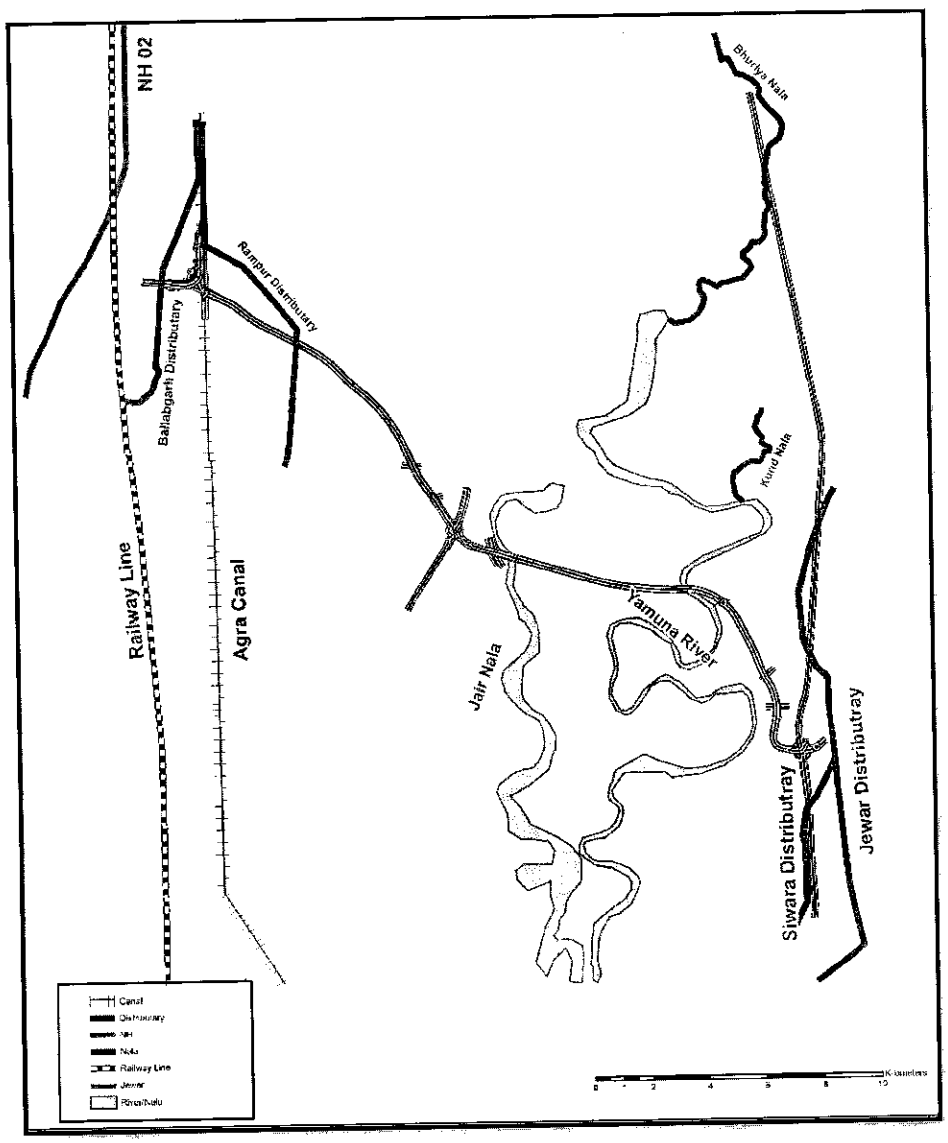


Figure 3.4: Key plan showing water bodies and Forest

3.2.2 Land Use and Terrain

3.2.2.1 Land Use

The proposed project exhibits diversity in landuse- land cover owing to variations in the geomorphology, soils, climate groundwater quality and irrigation facilities etc. The landuse-land cover map of the proposed project of length 31.060 km depicts the distribution of forest area, agricultural land, wastelands, and water bodies, built up land, mining area and other land.

The major habitation along the highway corridor are Ballabhgarh, Mohna, Palwal & Jewar. The project area is located in the state of Haryana & Uttar-Pradesh.

3.2.2.2 Land Cover

The land use map for a buffer length of 1 km around the proposed project has been prepared to a scale of 1:25000 based on recent satellite imagery. It shows features such as croplands, agricultural plantations, fallow lands, wastelands, water bodies, built-up areas, forest areas and other surface features such as railway tracks, roads.

Table 3.3 describes the land use of the study area. The land use map based on satellite imagery within 1 km buffer length of the proposed project has been shown in Figure 3.5 and enclosed as ***Annexure A.***

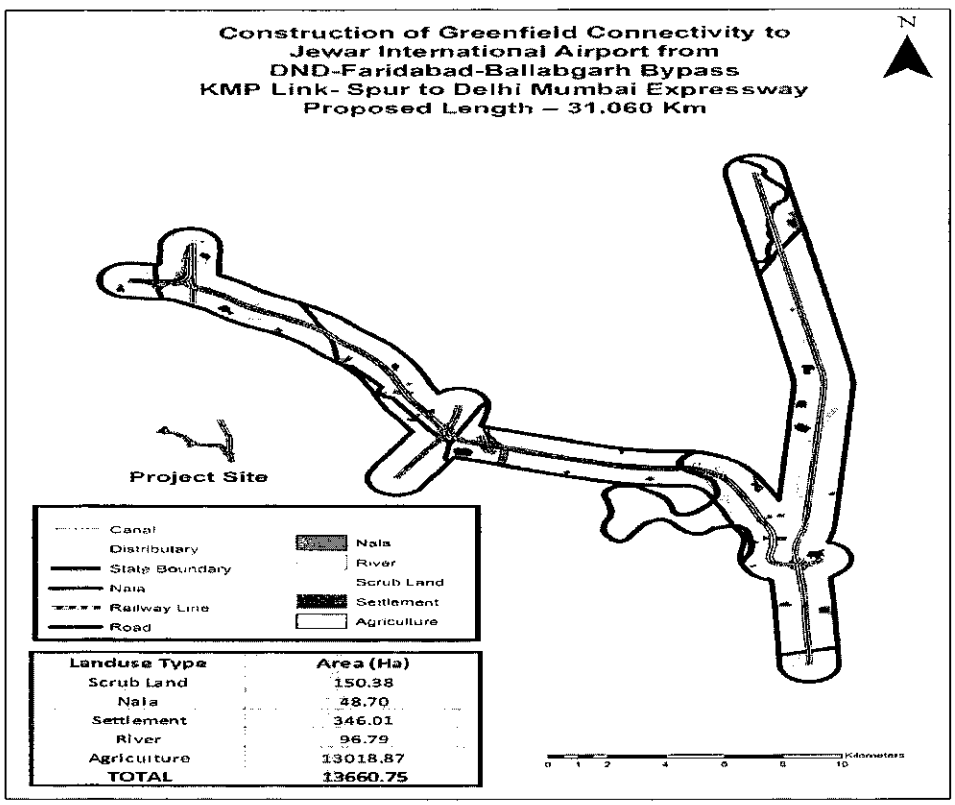


Figure 3.5: Land use Map of the study are within 1 km

Table 3.3: Land use of the Study Area (1 Km)

S.No	Particulars	Area (Ha)
1	Scrub land	150.38
2	Nalla	48.70
3	Settlement	346.01
4	River	96.79
6	Agriculture	13018.87
	Total	**18996.82**

3.2.3 Seismicity

Proposed alignment Faridabad, Palwal & Gautam Budh Nagar falls under seismic zone IV (moderate-high damage risk zone) as per Wind and Cyclone Hazard Classification of India.

Project Area

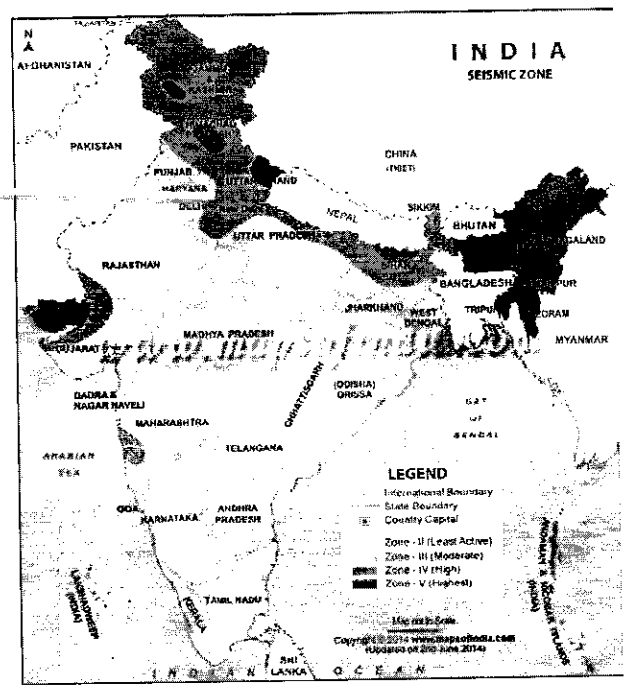


Figure 3.6 Hazard map of the areas covered in the project road

3.2.4 Climate and Micro-Meteorological Parameters

3.2.4.1 Rainfall and Climate

Faridabad & Palwal District: The normal annual rainfall in Faridabad district is about 542 mm spread over 27 days. The south west monsoon sets in the last week of June and withdraws towards the end of September and contributes about 85% of the annual rainfall. July and August are the wettest months 15% of the annual rainfall occurs during the non-monsoon months in the wake of thunder storms and western disturbances.

Gautam Budh Nagar District: The maximum rainfall of 700.6 mm occurs during the monsoon period i.e., June to September having the normal value of 600 mm which is 85.7% of annual rainfall. August is the wettest month having the normal rainfall of 205.8 mm followed by July when normal rainfall received about 194.4 mm.

3.2.4.2 Temperature

Faridabad & Palwal District: The period from October to December constitutes post monsoon season. The cold weather season prevails from January to the beginning of March and followed by the hot weather or summer season, which prevails up to the last week of June. Mean Maximum: 41^0C (May & June). Mean Minimum: 8^0 C (January).

Gautam Budh Nagar District: The district experiences the hottest weather in the month of June with average mean temperature of 32.85°C followed by May with 31.9°C. The coldest month is January with average mean temperature of 14.2°C followed by December with 15.4°C.

3.2.4.3 Humidity

Faridabad & Palwal District: During three months of southwest monsoon from last week of June to September, the moist air of oceanic penetrate into the district and causes high humidity

Gautam Budh Nagar District: During the southwest monsoon season the relative humidity is high and after the withdrawal of the monsoon humidity decreases. The mean monthly maximum relative humidity in the morning of August month is 84% and mean monthly minimum relative humidity measured in the morning of May is 41 %.

3.2.5 Geomorphology and Soil

3.2.5.1 Geomorphology

Faridabad & Palwal District: The area comprises almost flat plains traversed by one ridge running N-S to NNE-SSW direction, divides the alluvium into two parts. The major river is Yamuna which is a perennial river.

Gautam Budh Nagar District: Gautam Budh Nagar district, a part of Ganga-Yamuna Doab in the vicinity of River Yamuna, forms almost a monotonous plain with occurrence of sand dunes, sandy ridges, ravenous tracts and depressions close to the river system of Yamuna.

3.2.5.2 Agriculture

Principal Crops of Project area

Faridabad & Palwal District: Paddy, Bajra, Jowar, kharif pulses and kharif vegetables.

Gautam Budh Nagar District: Wheat, rice and sugar cane.

3.2.5.3 Soil Types

Faridabad & Palwal District: Soils of districts are classified as tropical and brown soils, existing in major parts of the district.

Gautam Budh Nagar District: Major soil types are- Sandy loam and clay (Bhur, Matir & Dumat).

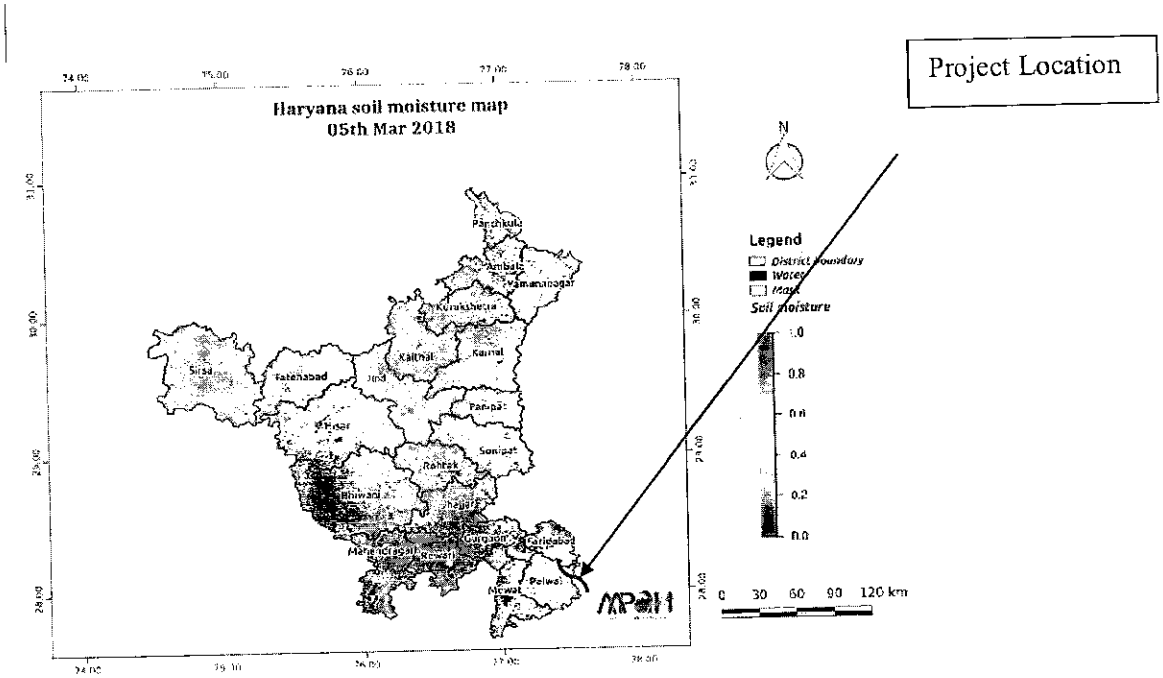


Figure 3.7: Soil Moisture Map of Haryana showing Project Area

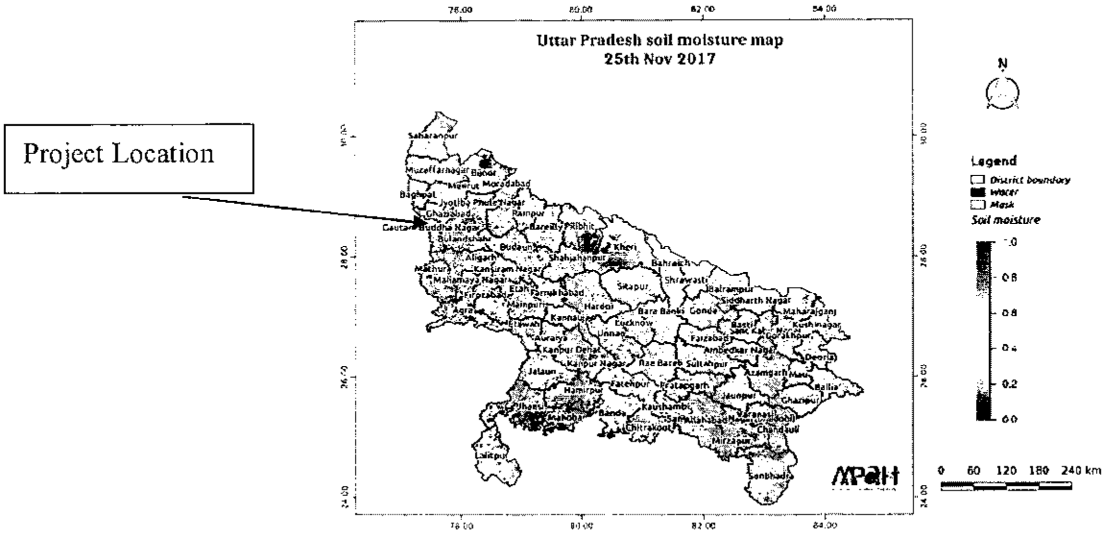


Figure 3.7(a): Soil Moisture Map of Uttar Pradesh showing Project Area

3.2.6 Soil Characteristics

3.2.6.1 Field Study and Sampling Locations

For studying soil quality 5 No.s of sampling location was selected to assess the existing soil conditions in and along the project alignment representing various land use conditions during October 2021 to December 2021. The sample was collected by ramming a core-cutter into the soil up to 90-cm depth. The sample collection, preservation, storage, transportation and analysis were carried out as per the standard methods. The soil samples after collection were immediately subjected to the analysis of various parameters in the NABL Accredited laboratory. The details of the soil sampling locations have been presented in Table 3.4 and Figure 3.8.

Table 3.4: Soil Sampling Locations

S. No.	Notation	Location	Chainage	Lat	Long
1	SQ1	Shahupura	01+200	28°18'10.91"N	77°20'7.67"E
2	SQ2	Panhera Khurd	08+800	28°16'5.51"N	77°24'3.92"E
3	SQ3	Mohna	14+900	28°13'22.52"N	77°26'42.71"E
4	SQ4	Failada Bangar	30+600	28°12'50.82"N	77°32'57.67"E
5	SQ5	Dayant Pur	31+100	28°10'43.31"N	77°34'19.25"E

Figure 3.8: Soil Sampling Locations

3.2.6.2 Soil Quality along the study area

All these soil samples were collected along the proposed highway and analysed for the physical, chemical properties and heavy metal concentrations. They were assessed for agricultural and afforestation potential. The characteristic of the soil along the highway has been presented in Table 3.5.

Table 3.5: Soil Analysis report

Sl. No.	Parameters		Unit	SQ1	SQ2	SQ3	SQ4	SQ5	Test Method
1.	pH		-	7.62	7.27	7.52	7.36	7.28	IS:2720(Part-26)
2.	Electrical Conductivity at 25° C (1:5suspension.)		µmhos/cm	378.00	465.00	518.00	415.00	462.00	IS:2720(Part-21)
3.	Sodium (as Na)		(mg/kg)	52.37	51.95	51.95	54.21	52.75	STP/SOIL
4.	Water holding capacity		(%) by mass	35.21	34.87	32.86	35.98	31.92	STP/SOIL
5.	Potassium (as K)		(kg/ha)	282.0	284.0	275.9	283.7	282.4	STP/SOIL
6.	Texture	Sand	(% by mass)	68.00	69.00	68.00	68.00	62.00	STP/SOIL
		Clay	(% by mass)	19.00	16.00	17.00	19.00	18.00	STP/SOIL
		Silt	(% by mass)	13.00	15.00	15.00	13.00	20.00	STP/SOIL
7.	Calcium (as Ca)		(mg/kg)	559.73	459.26	558.47	561.4	657.23	STP/SOIL
8.	Magnesium (as Mg)		(mg/kg)	97.10	112.75	105.28	113.87	122.57	STP/SOIL
9.	Sodium Absorption Ration (SAR)		-	4.98	4.96	4.53	4.73	4.64	STP/SOIL
10.	Available Phosphorus (as		Kg/ha	59.0	58.0	56.0	58.0	58.0	STP/SOIL

	P)							
11.	Organic carbon	(%) by mass)	0.53	0.52	0.48	0.53	0.50	STP/SOIL
12.	Porosity	(% by mass)	45.21	44.91	40.89	42.85	42.91	STP/SOIL
13.	Bulk Density	(kg/cm^3)	1.69	1.67	1.47	1.34	1.32	STP/SOIL
14.	Available Nitrogen (Kg/ Hectare)	Kg/ha	362	460	425	270	257	STP/SOIL
15.	Total alkalinity	(mg/l)	2.4	2.4	1.7	2.5	2.8	STP/SOIL
16.	Chlorides	(mg/l)	11	11	9.8	6.9	8.47	STP/SOIL
17.	Available Potassium	(Kg/ Hectare)	273	268	218	197	268	STP/SOIL
18.	Zinc (as Zn)	(mg/kg)	68.15	80.16	85.20	75.10	96.12	STP/SOIL

3.2.6.3 Interpretation of results

Physical characteristics of soil were characterized through specific parameters viz bulk density, porosity, water holding capacity, pH, electrical conductivity and texture. Soil pH plays an important role in the availability of nutrients. Soil microbial activity as well as solubility of metal ions is also dependent on pH. In the study area, variations in the pH of the soil were found to be slightly neutral to alkaline (7.27 to 7.62). Electrical conductivity (EC) is a measure of the soluble salts and ionic activity in the soil. In the collected soil samples the conductivity ranged from 378-518 µmhos/cm. Water holding capacity from 31.92 to 35.98 (percentage) by mass. The soils with low bulk density have favourable physical condition where as those with high bulk density exhibit poor physical conditions for agriculture crops.

Table 3.5 (a) Standard Soil Classification of Soil

S.No.	Parameters	Classification
1	pH	< 4.5 extremely acidic
		4.51 -5.0 very strong acidic
		5.01-5.5 strongly acidic
		5.51-6.0 moderately acidic
		6.1-6.5 slightly acidic
		6.51-7.3 Neutral
		7.31-7.8 slightly alkaline
		7.81-8.5 moderately alkaline
		8.51-9.0 strongly alkaline
		> 9.0 Very strongly alkaline
2	Salinity Electrical Conductivity (mho/cm)	Upto 1.0 average
	1 mho/cm = 1 ds/m	1-2 harmful to germination
		2-3 harmful to crops
3	Nitrogen (kg/ha)	Up to 50 very less
		51-100 less
		110-150 good
		151-300 better
		> 300 sufficient
4	Phosphorus (kg/ha)	Up to 15 very less
		15-30 less
		31-50 medium
		51-65 on average sufficient
		66-80 sufficient
		>80 more than sufficient
5	Potassium (kg/ha)	0-120 very less
		120-180 less
		180-240 medium
		241-300 average
		301-360 better
		>360 more than sufficient

3.2.7 Geology & Hydrogeology

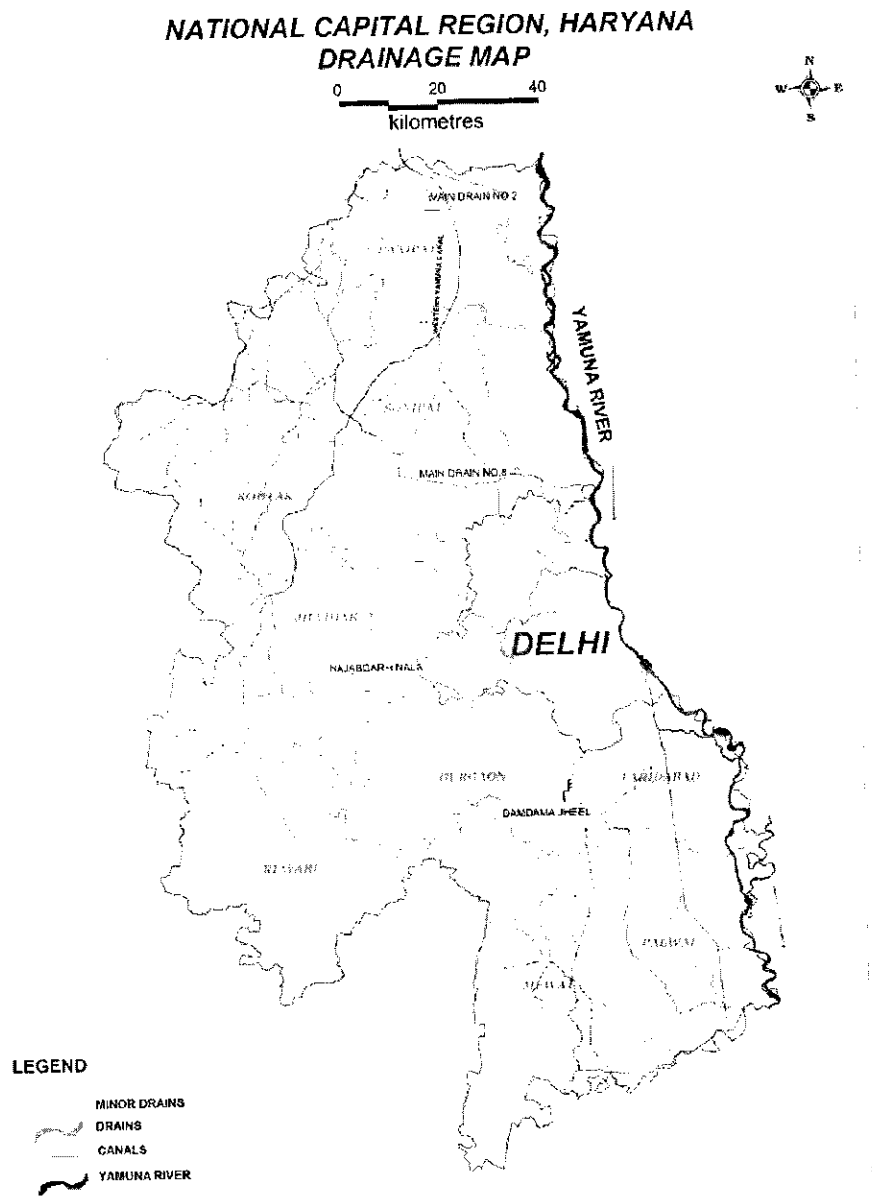
3.2.7.1 Geology: Geologic succession of Faridabad district is quite wide ranging in terms of age and rocks from Archean to Recent age are present in the area. Most of the northeastern part of the district is covered by younger and older alluvium, which is predominantly sandy and clayey in nature. In some parts of western faridbad eolian sand is also present as a thin cover above the alluvium sediments. Some parts in the northeastern region also show presence of Delhi Super Group quartzites, schists, phyllites and marbles.

3.2.7.2 Hydrogeology

Faridabad District: Ground water occurs in alluvium and the underlying weathered/fractured quartzites. Alluvium comprises sands, silt, Kankar and gravel which form the principal ground water bearing horizon. In Quartzite formation, occupying the north- western part of the district, ground water occurs in weathered and jointed fractured horizons. Weathering and fracturing has resulted in formation of semi-consolidated sand beds (BADARPUR SANDS) which form potential aquifer zones. This quartzite formation has not been explored for ground water occurrence. In alluvium, granular zones are evenly distributed in entire thickness which is negligible near the quartzite outcrops to over 350 m in the eastern parts near Yamuna River. In general, 6-14 granular zones mainly comprise fine sand, silt, clay and kankar. Deeper water level, in the depth range of 10m to 15 m occurs in the southeastern parts of Ballabgarh and Faridabad blocks. Water level elevation range from 220 to 180 m amsl and the general groundwater flow is towards southeast and east. wells in the eastern parts of Faridabad and Ballabgarh block also proves significant decline of water table in recent past.

Palwal District: Ground water occurs in alluvium and the underlying weathered/fractured quartzites. Alluvium comprises sands silt, Kankar and gravel. Which form the principal ground water bearing horizon. In Quartzite formation, occupying the north- western part of the district, ground water occurs in weathered and jointed fractured horizons. Weathering and fracturing has resulted in formation of semi-consolidated sand bads (BADARPUR SANDS) which form potential aquifer zones. The discharge of the wells ranges from 750 lpm to 900 lpm at a drawdown of5.5 to 7.00m. The transmissivity 'T' value ranges between 55 to 200 m 2 /day was determined. Shallow tube wells for irrigation use are generally constructed upto a depth of 40 m. The discharge of these shallow tubewells range 360 -600 litres per minutes.

Gautam Budh Nagar District: The thick unconsolidated sediments occur up to the explored depth of 352.0m in the area. The underlying basement comprising Delhi Quartzite has been reported to 10 be encountered at 116.4m depth at Brijbihar Exploratory borehole, 330.0 m at Tila moth and 325.0 m depth at Rajendra Nagar boreholes in Ghaziabad district (Singh & Srivastava, 1995). The alluvial deposits occur in Ganga - Yamuna Doab area comprises an aquifer system form good repository of ground water that occur in granular zones constituted of fine to coarse sand and occasional gravel. Thick clay beds inter lying with sand act as confining layers and separate the aquifers. The thickness of the unconsolidated sediments progressively increases towards east.



Faridabad District: The Depth to water level lies between 1.51 to 50.74 mbgl during pre-monsoon and 0.67 to 49.56 mbgl during post-monsoon period.

Palwal District: The depth to water level ranges from 2.00 mbgl to 10.75 mbgl during pre-monsoon period and 2 to 9.40 mbgl during post monsoon period.

Gautam Budh Nagar District: The depth to water level ranges from 3.35 to 14.40 mbgl during pre-monsoon period whereas it ranges from 2.00 m to 13.95 mbgl during post monsoon period.

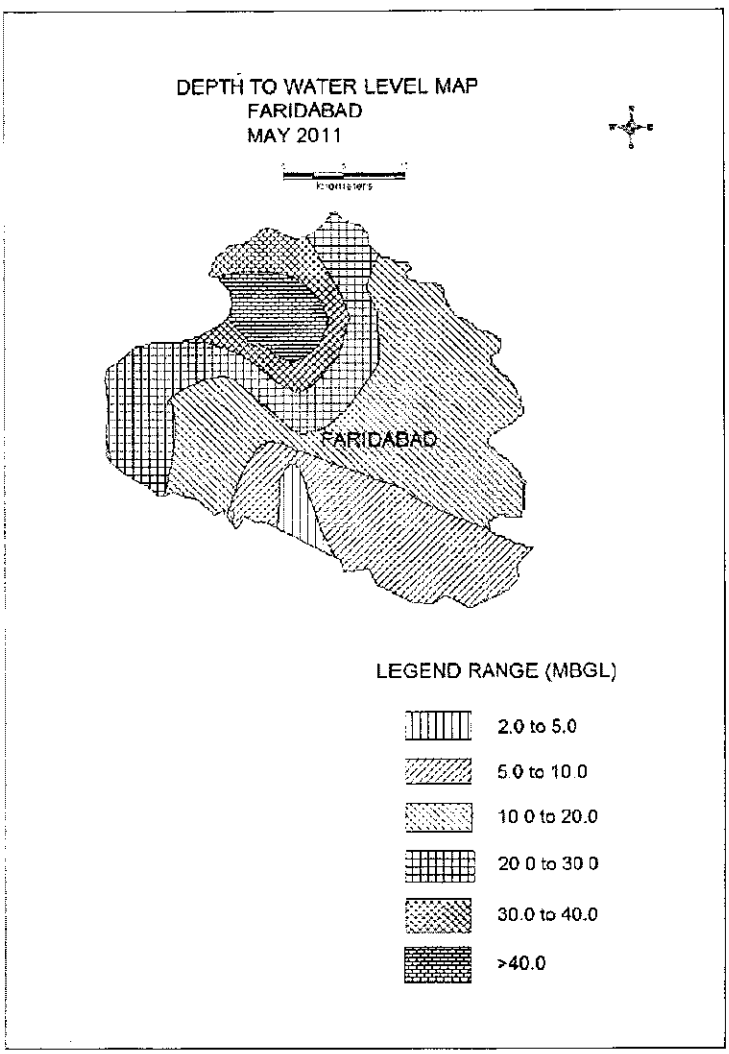


Figure 3.10: Pre-monsoon depth of water level (Faridabad District)

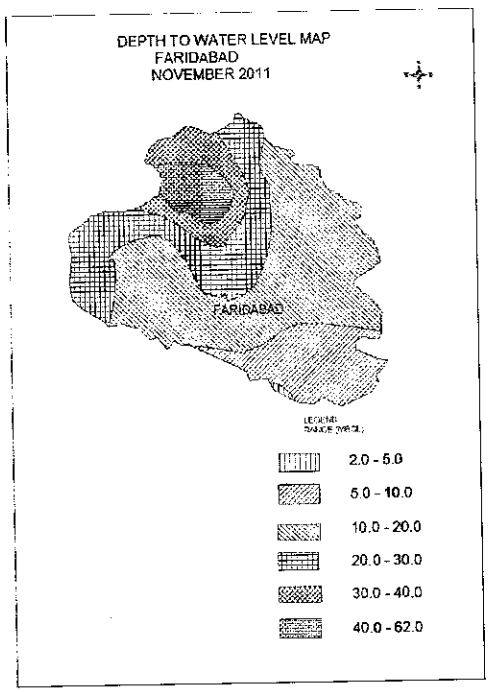


Figure 3.10(a) post-monsoon depth of water level (Faridabad District)

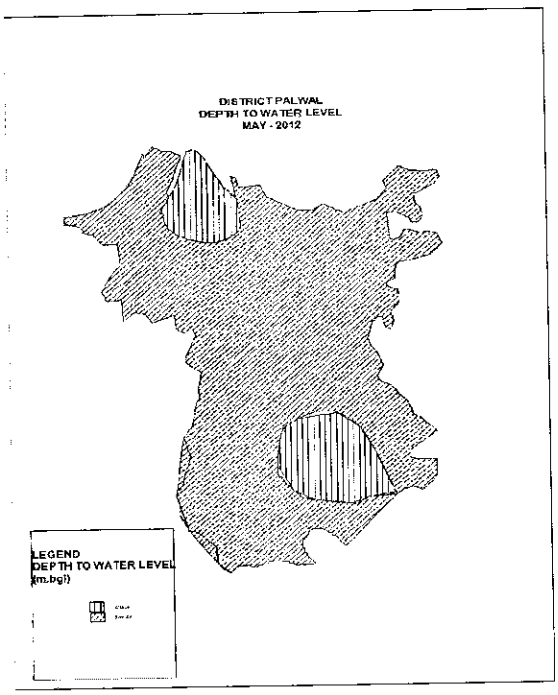


Figure 3.11: Pre-monsoon depth of water level (Palwal District)

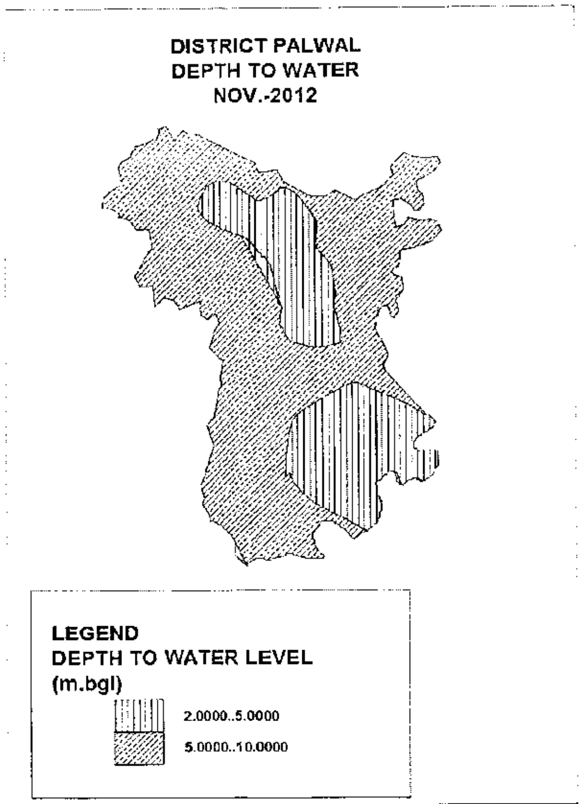


Figure 3.11(a) post-monsoon depth of water level (Palwal District)

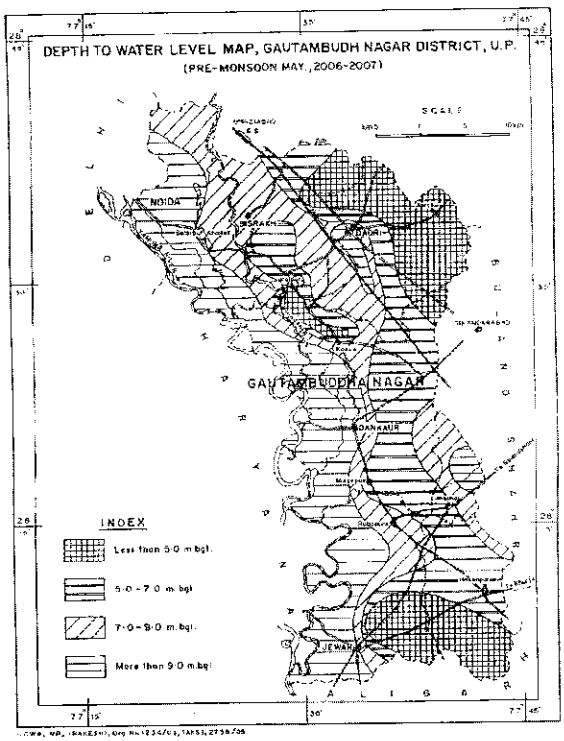


Figure 3.11(b): Pre-monsoon depth of water level (Gautam Budha Nagar District)

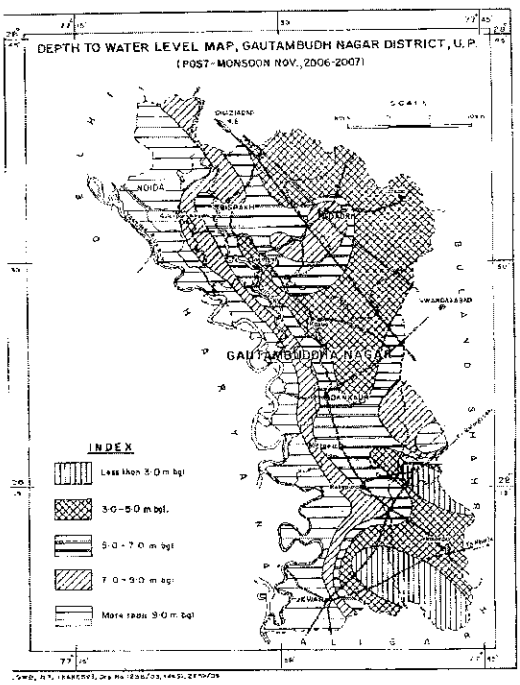


Figure 3.11(c): Post-monsoon depth of water level (Gautam Budha Nagar District)

3.3 WATER ENVIRONMENT

Water quality assessment is one of the essential components of EIA study. Such assessment helps in evaluating the existing health of water body and suggesting appropriate mitigation measures to minimize the potential impact from development projects. Water quality of ground water has been studied in order to assess proposed water-uses in construction, drinking, cooling and horticulture purpose.

3.3.1 Streams/Canals/Nalas/Water bodies and Bridges Crossings the proposed alignment.

Table 3.6: List of water bodies crossing the project alignments

S.No	Design Chainage	Name of Water Bodies
Major Bridges		
1	15+571	Yamuna River
Minor Bridges		
1	22+220	Yamuna River
2	27+923	Over irrigation canals
3	10+456	Over irrigation canals/Drains
4	31+325	Over irrigation canals/Drains

3.3.2 Ground Water Quality: 5 no.s of Samples of ground water were collected from existing hand pumps, wells and Tube-wells were analysed for parameters necessary to determine water quality (based on IS: 10500 criteria) and those which are relevant from the point of view of environmental impact of the proposed highway project during October 2021 to November 2021. The locations of the Water sampling have been presented in **Table 3.7 and Figure 3.12.**

Table 3.7: Ground water monitoring locations

S. No.	Notation	Location	Chainage	Lat	Long
1	GW1	Shahupura	01+200	28°18'10.91"N	77°20'7.67"E
2	GW2	Panhera Khurd	08+800	28°16'5.51"N	77°24'3.92"E
3	GW3	Mohna	14+900	28°13'22.52"N	77°26'42.71"E
4	GW4	Failada Bangar	30+600	28°12'50.82"N	77°32'57.67"E
5	GW5	Dayant Pur	31+100	28°10'43.31"N	77°34'19.25"E

Figure 3.12: Ground water monitoring Locations

3.3.2.1 Ground water quality along the project alignment

The analysis results for the ground water samples and surface water samples are given in below. The analyzed results are compared with the Acceptable and permissible limit standards (absence of Alternative source) as per IS 10500:2012.

Table 3.8: Ground water analysis report

ORGANOLEPTIC & PHYSICAL PARAMETERS

S.No.	Parameter	Test method	GW1	GW2	GW3	GW4	GW5	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Colour	IS-3025(P-04)	<1.0	<1.0	<1.0	<1.0	<1.0	Hazen Unit	5	15
2.	Odour	IS-3025(P-05)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	-	Agreeable	Agreeable
3.	Taste	IS-3025(P-07 & 08)	Agreeable	Agreeable	Agreeable	Agreeable	Agreeable	-	Agreeable	-
4.	Turbidity	IS-3025(P-10)	<1.0	<1.0	<1.0	<1.0	<1.0	NTU	1	5
5.	pH value	IS-3025(P-04)	7.18	7.46	7.45	7.58	7.47	-	6.5-8.5	-
6.	Total Dissolve Solid (TDS)	IS-3025(P-16)	1246	1480	1566	1312	1760	mg/l	500	2000

GENERAL PARAMETERS CONCERNING SUBSTANCES UNDESIRABLE IN EXCESSIVE AMOUNTS

S.No.	Parameter	Test method	GW1	GW2	GW3	GW4	GW5	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Aluminium (as Al)	IS: 3025 (P- 55)	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.03	0.2
2.	Total Ammonia	IS: 3025 (P- 34)	<0.10	<0.10	<0.10	<0.10	<0.10	mg/l	0.5	No Relaxation
3.	Anionic surface Detergents (as MBAS)	Annex K of IS-13428	<0.10	<0.10	<0.10	<0.10	<0.10	mg/l	0.2	1.0
4.	Barium (as Ba)	IS: 15302	<0.10	<0.10	<0.10	<0.10	<0.10	mg/l	0.7	No Relaxation
5.	Boron (as B)	IS: 3025 (P- 57)	<0.10	<0.10	<0.10	<0.10	<0.10	mg/l	0.5	1.0
6.	Calcium (as Ca)	IS: 3025 (P- 40)	80.35	98.21	99.80	84.23	112.60	mg/l	75	200
7.	Chloramines (as Cl2)	IS: 3025 (P- 26)	<1.00	<1.00	<1.00	<1.00	<1.00	mg/l	4.0	No Relaxation
8.	Chloride (as Cl)	IS: 3025 (P- 32)	178.50	189.60	215.36	186.60	285.18	mg/l	250	1000
9.	Copper (as Cu)	IS: 3025 (P-42)	<0.05	<0.05	<0.05	<0.05	<0.05	mg/l	0.05	1.5
10.	Fluoride (as F)	IS: 3025 (P-60)	0.96	1.02	1.08	0.98	1.32	mg/l	1.0	1.5
11.	Free Residual Chlorine	IS: 3025 (P-26)	<0.1	<0.1	<0.1	<0.1	<0.1	mg/l	0.2	1.0
12.	Total Iron (as Fe)	IS: 3025(P-52)	0.234	0.256	0.249	0.216	0.272	mg/l	1.0	No Relaxation
13.	Magnesium (as Mg)	IS: 3025 (P-46)	51.09	65.28	79.98	61.57	77.56	mg/l	30	100

14.	Manganese (as Mn)	Clause 35 of IS 3025	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.1	0.3
15.	Mineral Oil	Clause 6 of IS: 3025	<0.50	<0.50	<0.50	<0.50	<0.50	mg/l	0.5	No Relaxation
16.	Nitrate (as NO3)	IS: 3025 (P- 34)	15.23	19.80	21.18	18.30	23.80	mg/l	45	No Relaxation
17.	Selenium (as Se)	IS: 3025 (P- 56)	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.01	No Relaxation
18.	Silver (as Ag)	Annex J IS: 13428	<0.05	<0.05	<0.05	<0.05	<0.05	mg/l	0.1	No Relaxation
19.	Sulphate (as SO4)	IS: 3025 (P- 24)	82.60	106.12	114.10	95.80	138.25	mg/l	200	400
20.	Sulphide (as H2S)	IS-3025 (P-29)	<0.05	<0.05	<0.05	<0.05	<0.05	mg/l	0.05	No Relaxation
21.	Alkalinity (as CaCO3)	IS: 3025 (P- 23)	398.0	428.0	456.0	377.0	423.0	mg/l	200	600
22.	Total Hardness (as CaCO3)	IS: 3025 (P- 23)	412.0	512.0	580.0	465.0	602.0	mg/l	200	600
23.	Zinc (as Zn)	IS: 3025 (P- 49)	0.215	0.265	0.284	0.212	0.258	mg/l		15

PARAMETERS CONCERNING TOXIC SUBSTANCES:

S.No.	Parameter	Test method	GW1	GW2	GW3	GW4	GW5	Unit	Requirement (Acceptable Limit)	Permissible Limit in absence of alternate source
1.	Cadmium (as Cd)	IS-3025(P-41)	<0.001	<0.001	<0.001	<0.001	<0.001	mg/l	0.003	No Relaxation
2.	Cyanide (as CN)	IS-3025(P-27)	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.05	No Relaxation

3.	Lead (as Pb)	IS-3025(P-47)	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.01	No Relaxation
4.	Mercury (as Hg)	IS-3025(P-48)	<0.001	<0.001	<0.001	<0.001	<0.001	mg/l	0.001	No Relaxation
5.	Molybdenum (Mo)	IS-3025(P-2)	<0.05	<0.05	<0.05	<0.05	<0.05	mg/l	0.07	No Relaxation
6.	Nickel (as Ni)	Annex L of IS-13428	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.02	No Relaxation
7.	Polynuclear Aromatic	APHA 6440	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	mg/l	0.0001	No Relaxation
8.	Poly chlorinatedbiphenyl	APHA 6630	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	mg/l	0.0005	No Relaxation
9.	Arsenic (as As)	IS-3025(P-37)	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	0.01	No Relaxation
10.	Total Chromium (as Cr)	Annex J of IS-13428	<0.05	<0.05	<0.05	<0.05	<0.05	mg/l	0.05	No Relaxation

3.3.3 Surface Water Quality: 3 no.s samples of surface water were collected from rivers and available local surface water body like ponds, lakes etc. of samples were analysed for parameters necessary to determine water quality during March 2021 to May 2021.

Table 3.9: Surface water locations

S No	Notation	Location	Type	Chainage	Lat	Long
1	SW1	Shahpura	Agra Canal	01+700	28°18'7.72"N	77°20'49.97"E
2	SW2	Mohna	Jair Nala	14+900	28°13'22.52"N	28°13'22.52"N
3	SW3	Failada Bangar	Yamuna River	66+700	28°12'50.82"N	77°32'57.67"E

Figure 3.13: Surface water monitoring Locations

3.3.3.1 Surface water quality along the project alignment

The analysis results for the Surface water samples and surface water samples are given in Table below. The analyzed results are compared with the Acceptable and permissible limit standards.

Table 3.10: Surface water analysis report

S.No.	Parameter	Test Method	SW1	SW2	SW3	Units
1.	pH	IS:3025(Part-11)	7.45	7.36	7.36	-
2.	Temperature	IS:3025(Part-9)	20.0	20.0	18.0	^{0}C
3.	Turbidity	IS:3025(Part-10)	48.0	84.2	92.2	NTU
4.	Electric Conductivity @25^{0}C	IS:3025(Part-14)	890	1396	1443	µS/cm
5.	Sulphate (SO4)	IS:3025(Part-24)	54.2	84.2	104	mg/l
6.	Nitrate (NO3)	IS:3025(Part-34)	46.8	63.18	66.0	mg/l
7.	Total Hardness (as CaCO3)	IS:3025(Part-21)	112	260	312	mg/l
8.	Chloride (as Cl)	IS:3025(Part-32)	78.5	126.85	225.31	mg/l
9.	Fluoride (as F)	APHA 4500F	1.02	2.14	2.29	mg/l
10.	COD (as O2)	APHA-5220 B	41.0	172	296	mg/l
11.	Iron (as Fe)	IS:3025(Part-53)	2.02	6.18	7.09	mg/l
12.	Dissolve Oxygen	IS-3025(Part-38)	5.6	1.6	<1.0	mg/l
13.	Total Dissolved Solid	IS:3025(Part-16)	520	938	1063	mg/l

14.	BOD (3 days at 27^0C)	IS:3025 (P-44)	18.0	62.0	110	mg/l
15.	Calcium (as Ca)	IS:3025(Part-40)	41.5	65.73	70.54	mg/l
16.	Magnesium (as Mg)	IS:3025(Part-46)	8.99	23.33	33.05	mg/l
17.	Arsenic (as As)	IS:3025(Part-37)	BDL	BDL	BDL	mg/l
18.	Lead (as Pb)	IS:3025(Part-47)	BDL	BDL	BDL	mg/l
19.	Copper (as Cu)	IS:3025(Part-42)	0.12	0.54	0.72	mg/l
20.	Zinc (as Zn)	IS:3025(Part-49)	1.08	1.86	2.18	mg/l
21.	Manganese (as Mn)	IS:3025(Part-59)	0.16	0.29	0.36	mg/l
22.	Total Chromium (as Cr)	IS:3025(Part-52)	<0.1	0.18	0.27	mg/l
23.	Sodium (as Na)	IS:3025(Part-45)	52.8	81.74	146	mg/l
24.	Potassium (as K)	IS:3025(Part-45)	1.2	3.4	4.0	mg/l
25.	Total Alkalinity (as $CaCO_3$)	IS:3025(Part-23)	98.0	296	398	mg/l
26.	Phosphate (as P)	IS:3025(Part-31)	0.165	0.209	0.325	mg/l
27.	Nitrite (as NO_2)	IS:3025(Part-34)	0.023	0.096	0.106	mg/l
28	Total Suspended Solid	IS:3025(Part-17)	45.0	126.7	135.0	mg/l
29.	Faecal Coliform	IS-1622	1.1×103	0.62×103	0.58×103	MPN/100 ml
30.	Total Coliform	IS-1622	2.5×103	0.75×103	0.66×103	MPN/100ml

3.3.3.2 Sampling Frequency

Parameters for analysis of water quality were selected based on the utility of the particular source of water as per CPCB guidance. Surface water quality was monitored for parameters as per Methods of Monitoring & Analysis published by CPCB and it was rated according to the CPCB Water Quality Criteria against A, B, C, D & E class of water. Water samples were collected as Grab water sample from sampling location for complete physico-chemical and bacteriological tests respectively. The samples were analysed as per standard procedure / method given in IS: 10500.

The surface water quality is compared with CPCB water quality criteria mentioned in Table 3.11 below:

Table 3.11: Water Quality Criteria as per Central Pollution Control Board

Designated-Best-Use	Class of water	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	Total Coliforms Organism MPN/100ml shall be 50 or less pH between 6.5 and 8.5 Dissolved Oxygen 6mg/l or more Biochemical Oxygen Demand 5 days 20°C 2mg/l or less
Outdoor bathing (Organized)	B	Total Coliforms Organism MPN/100ml shall be 500 or less; pH between 6.5 and 8.5; Dissolved Oxygen 5mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Drinking water source after conventional treatment and disinfection	C	Total Coliforms Organism MPN/100ml shall be 5000 or less; pH between 6 to 9; Dissolved Oxygen 4mg/l or more Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Propagation of Wild life and Fisheries	D	pH between 6.5 to 8.5 Dissolved Oxygen 4mg/l or more Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial	E	pH between 6.0 to 8.5

Cooling, Controlled Waste disposal		Electrical Conductivity at 25°C micro mhos/cm Max.2250 Sodium absorption Ratio Max. 26 Boron Max. 2mg/l
	Below-E	Not Meeting A, B, C, D & E Criteria

3.4 AIR ENVIRONMENT

Meteorology is the key to understand the air quality. The essential relationship between metcorology and atmospheric dispersion involves the wind in tlic broadest sense. Wind fluctuations over a very wide range of time, accomplish dispersion and strongly influence other processes associated with them.

Meteorological data was generated during the Pre-monsoon monitoring period October 2021 to December 2021. Summarized Project site Meteorological Data for Pre-Monsoon is given in Table 3.12. Wind rosc diagram generated as per the study of meteorological data is shown in Figure 3.14.

The following parameters were recorded at hourly intervals continuously during monitoring period, except rainfall that was recorded on daily basis.

- Wind speed
- Wind Direction
- Air Temperature
- Micro-Meteorological
- Temp
- Humidity & rainfall

Table 3.12: Summarized Project site Meteorological Data for Pre-Monsoon

Month	Wind Speed (km/h)	Temperature (°C)		Rainfall (mm)	
	Wind Speed	Max	Min	Avg.	No. of rainy Days
October 2021	2.3	37.1	11.3	4.5	0.6
November 2021	3.3	41.9	16.7	5.8	0.8
December 2021	3.4	44.3	20.9	18.3	1.6

Source: IMD

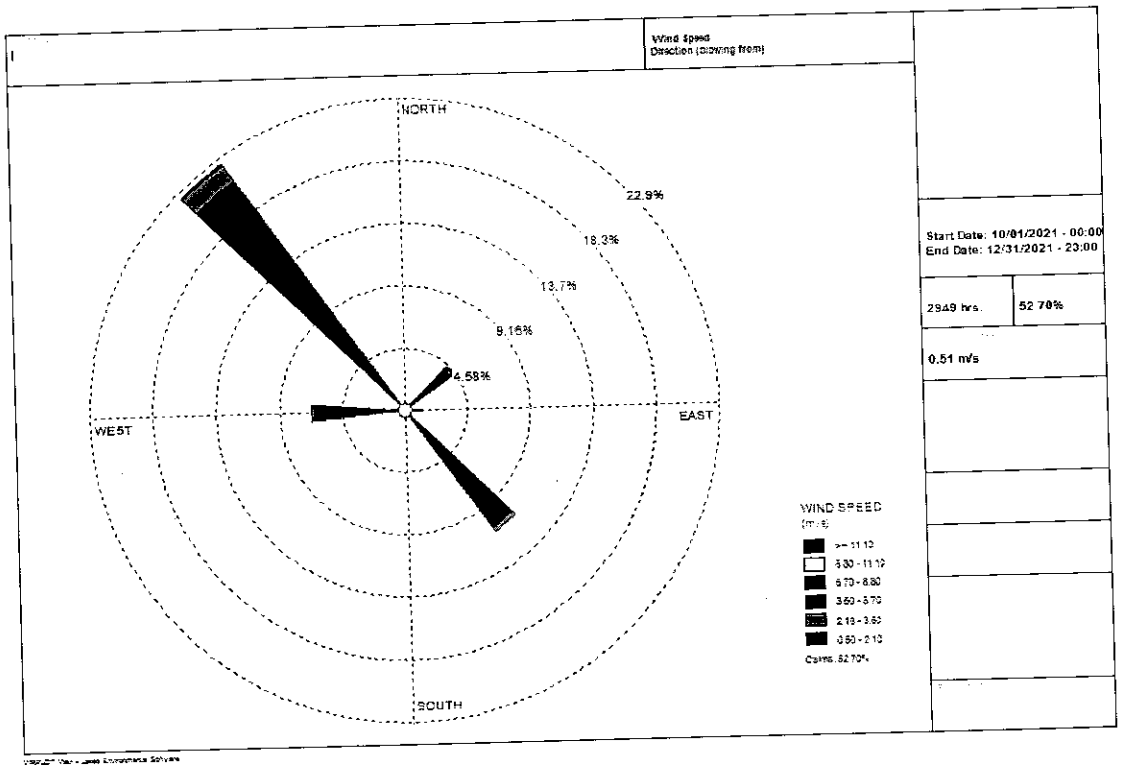


Figure 3.14: Wind Rose Diagram

3.4.1 Ambient Air Quality

The ambient air quality was monitored in the impact area as per MoEF & CC guidelines. The study area represents entirely rural environment. The prime objective of the baseline air quality study was to assess the ambient air quality of the site.

3.4.1.1 Selection Criteria for Monitoring Location

The baseline status of the ambient air quality has been assessed through a scientifically designed ambient air quality network. The design of monitoring network in the air quality surveillance Programme has been based on the following consideration.

- Meteorological parameters including wind direction
- Topography of the study area
- Representative of regional background air quality for obtaining baseline status
- Representative of likely impact areas.

Ambient Air Quality Monitoring (AAQM) stations were set up at 5 locations with due consideration to the above mentioned points. AAQM locations were selected in downwind, upwind as well as crosswind direction of the proposed construction covering core and buffer zones. The details of the monitoring stations locations are given in Table 3.13 and shown in map as Figure 3.15.

Ambient air quality monitoring was carried out twice a week with a frequency of 24 hours for one month during the study period. The common air pollutant namely Particulate Matter-10 (PM_{10}) & $PM_{2.5}$, Sulphur-dioxide (SO_2) and Oxides of Nitrogen (NO_2) has been measured through a planned field monitoring.

The baseline values of the air pollutants of concern are presented in Tables below statistical parameters like minimum, maximum, average and 98th percentiles have been computed from the observed field data for all sampling stations and are given Table 3.14 (a) to 3.14 (e). These are compared with the standards prescribed by Central Pollution Control Board (CPCB) for industrial, residential and rural zone.

Table 3.13: Air Monitoring Locations

S No	Notation	Location	Chainage	Lat	Long
1	AAQ1	Shahupura	01+200	28°18'10.91"N	77°20'7.67"E
2	AAQ2	Panhera Khurd	08+800	28°16'5.51"N	77°24'3.92"E
3	AAQ3	Mohna	14+900	28°13'22.52"N	77°26'42.71"E
4	AAQ4	Failada Bangar	30+600	28°12'50.82"N	77°32'57.67"E
5	AAQ5	Dayant Pur	31+100	28°10'43.31"N	77°34'19.25"E

Figure 3.15: Air Monitoring Locations

3.4.1.2 Air quality along the project alignment

Air Quality Monitoring results are presented in below Tables. The results are compared with the standards prescribed by Central Pollution Control Board (CPCB) for "Rural, Residential and other areas".

Table 3.14 (a) Ambient Air Quality for the location AAQ1

S. No.	Monitoring Date	PM10(μg/m³)	PM2.5(μg/m³)	SO_2(μg/m³)	NO_2(μg/m³)	CO (mg/m³)
		CPCBVolume-1/ Gravimetric	IS:5182(Part-23)	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-10)
1	01.10.2021	77.82	36.53	9.65	13.54	0.65
2	04.10.2021	70.14	37.56	10.35	12.48	1.36
3	09.10.2021	73.61	36.54	9.63	10.42	0.96
4	11.10.2021	77.17	31.78	12.48	13.63	0.75
5	16.10.2021	70.74	34.51	10.65	12.79	0.95
6	18.10.2021	68.8	37.81	9.60	15.56	1.47
7	23.10.2021	73.95	40.52	12.85	14.46	0.89
8	26.10.2021	77.4	41.9	11.21	12.50	0.69
9	01.11.2021	74.68	38.96	9.63	10.68	1.10
10	02.11.2021	77.62	35.69	10.69	15.63	1.66
11	06.11.2021	73.77	45.53	11.3	16.39	0.39
12	11.11.2021	69.69	41.52	12.69	15.53	1.66
13	15.11.2021	77.31	46.91	9.66	10.74	1.59
14	18.11.2021	80.18	39.88	10.68	12.68	0.47
15	22.11.2021	75.92	38.65	9.67	15.72	0.58
16	27.11.2021	81.82	44.76	12.54	14.66	0.69
17	02.12.2021	77.34	39.07	9.70	12.58	0.87
18	04.12.2021	80.34	34.52	9.72	10.55	1.47
19	08.12.2021	75.02	41.27	9.58	12.45	1.69
20	13.12.2021	72.84	48.84	10.67	15.86	0.96
21	20.12.2021	85.75	49.47	10.62	14.72	0.87
22	23.12.2021	78.96	39.97	11.24	12.52	1.63

23	27.12.2021	76.64	38.61	10.63	13.51	1.11
24	29.12.2021	69.94	42.75	9.62	12.73	0.89
Min		**68.80**	**31.78**	**9.58**	**10.42**	**0.39**
Max		**85.75**	**49.47**	**12.85**	**16.39**	**1.69**
Avg		**75.73**	**40.15**	**10.63**	**13.43**	**1.06**
P 98		**83.94**	**49.18**	**12.78**	**16.15**	**1.68**
NAAQS, For 24 hourly monitoring (except CO for Eight hour)		100 µg/m3	60 µg/m3	80 µg/m3	80 µg/m3	2.0 mg/m3

Table 3.14(b): Ambient Air Quality for the location AAQ2

S. No.	Date	Test Parameters				
		PM_{10} (µg/m^3)	$PM_{2.5}$ (µg/m^3)	SO_2 (µg /m^3)	NO_2 (µg /m^3)	CO (mg/m^3)
		IS:5182(Part-23)	CPCBVolume-1/ Gravimetric	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-10)
1	01.10.2021	59.36	29.80	8.63	10.52	1.06
2	04.10.2021	71.45	29.77	12.69	16.36	1.05
3	09.10.2021	59.30	29.78	11.70	16.78	1.25
4	11.10.2021	78.45	38.14	8.45	10.63	1.45
5	16.10.2021	75..36	30.25	10.47	11.47	1.36
6	18.10.2021	78.42	29.86	11.72	16.72	1.78
7	23.10.2021	59.38	39.75	8.96	10.48	1.68
8	26.10.2021	71.00	29.53	11.73	16.72	1.52
9	01.11.2021	75.14	35.91	10.73	11.69	0.89
10	02.11.2021	72.15	32.02	8.59	11.47	0.78
11	06.11.2021	59.45	29.76	10.59	11.42	0.96
12	11.11.2021	73.69	39.64	11.70	16.76	0.56
13	15.11.2021	74.52	33.78	8.57	15.94	1.63
14	18.11.2021	71.56	30.22	9.86	16.37	1.48

15	22.11.2021	77.85	35.81	9.68	16.58	0.68
16	27.11.2021	79.62	39.85	8.25	15.91	1.75
17	02.12.2021	74.15	35.85	10.53	15.69	0.96
18	04.12.2021	79.95	26.47	9.47	16.74	1.47
19	08.12.2021	59.30	30.30	8.63	11.85	0.53
20	13.12.2021	65.38	39.58	10.42	15.83	1.47
21	20.12.2021	72.14	29.87	11.84	11.35	1.44
22	23.12.2021	60.23	29.94	12.77	15.91	0.89
23	27.12.2021	76.25	29.86	11.76	15.77	0.47
24	29.12.2021	71.41	29.73	11.55	15.67	1.67
Min		**59.30**	**26.47**	**8.25**	**10.48**	**0.47**
Max		**79.95**	**39.85**	**12.77**	**16.78**	**1.78**
Avg		**70.44**	**32.73**	**10.39**	**14.36**	**1.20**
P 98		**79.80**	**39.80**	**12.73**	**16.77**	**1.77**
NAAQS, For 24 hourly monitoring (except CO for Eight hour)		100 µg/m3	60 µg/m3	80 µg/m3	80 µg/m3	2.0 mg/m3

Table 3.14(c): Ambient Air Quality for the location AAQ3

S. No.	Monitoring Date	PM100 (µg/m^3)	PM2.5 (µg/m^3)	SO_2 (µg/m^3)	NO_2 (µg/m^3)	CO (mg/m^3)
		CPCBVolume-1/ Gravimetric	IS:5182(Part-23)	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-10)
1	02.03.2020	73.54	26.73	8.62	12.96	1.22
2	03.03.2020	67.27	27.77	11.78	11.06	1.28
3	09.03.2020	73.28	26.01	12.28	15.28	1.47
4	10.03.2020	65.31	29.54	8.45	10.86	1.65
5	17.03.2020	67.19	27.96	11.79	13.85	1.66
6	18.03.2020	65.05	30.91	10.33	11.32	1.24
7	25.03.2020	73.41	31.9	8.52	14.63	0.35
8	26.10.2021	77.35	28.75	8.18	15.29	1.24

9	01.11.2021	72.57	32.41	10.47	12.45	1.18
10	02.11.2021	71.44	26.99	8.63	10.57	1.38
11	06.11.2021	65.89	33.54	10.23	11.24	0.52
12	11.11.2021	75.48	31.27	8.23	11.52	0.43
13	15.11.2021	77.87	36.93	8.48	14.63	0.59
14	18.11.2021	80.42	35.94	12.08	15.42	1.56
15	22.11.2021	70.13	31.24	8.18	10.66	1.4
16	27.11.2021	74.74	29.16	8.65	14.57	0.63
17	02.12.2021	71.23	33.45	10.42	11.47	0.53
18	04.12.2021	74.88	27.93	8.17	13.45	0.57
19	08.12.2021	70.42	32.66	8.75	12.53	1.47
20	13.12.2021	75.34	30.09	8.19	10.74	0.65
21	20.12.2021	72.2	28.41	11.97	14.25	1.68
22	23.12.2021	69.94	28.38	10.42	13.52	0.48
23	27.12.2021	72.4	29.14	12.02	13.65	1.7
24	29.12.2021	76.23	30.87	8.16	15.47	0.66
Min		**65.05**	**26.01**	**8.16**	**10.57**	**0.35**
Max		**80.42**	**36.93**	**12.28**	**15.47**	**1.70**
Avg		**72.23**	**30.33**	**9.71**	**12.97**	**1.06**
P 98		**79.25**	**36.47**	**12.19**	**15.45**	**1.69**
NAAQS, For 24 hourly monitoring (except CO for Eight hour)		100 µg/m^3	60 µg/m^3	80 µg/m^3	80 µg/m^3	2.0 mg/m3

Table 3.14(d): Ambient Air Quality for the location AAQ4

S. No.	Date	Test Parameters				
		PM_{10} (µg/m^3)	$PM_{2.5}$ (µg/m^3)	SO_2 (µg /m^3)	NO_2 (µg /m^3)	CO (mg/m^3)
		IS:5182(Part-23)	CPCBVolume-1/ Gravimetric	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-10)

1	04.10.2021	71.56	30.62	10.56	10.98	1.24
2	05.10.2021	80.64	42.85	9.75	10.98	0.86
3	12.10.2021	58.47	29.56	12.86	12.02	1.57
4	15.10.2021	80.65	43.65	10.36	11.12	1.48
5	19.10.2021	55.46	27.45	10.11	13.97	0.96
6	22.10.2021	53.42	27.05	13.14	10.99	1.72
7	26.10.2021	81.75	37.85	10.49	11.00	0.75
8	27.10.2021	74.58	44.58	10.31	11.14	1.38
9	03.11.2021	56.32	28.79	9.81	12.16	1.19
10	06.11.2021	82.59	31.78	10.21	14.03	0.96
11	11.11.2021	76.66	34.74	12.47	11.07	0.44
12	12.11.2021	65.85	44.63	10.65	15.4	0.86
13	18.11.2021	59.37	30.62	9.87	11.11	0.47
14	20.11.2021	84.56	34.52	10.24	13.08	0.58
15	25.11.2021	76.42	44.15	12.85	12.07	1.52
16	26.11.2021	65.35	34.21	13.05	11.10	1.48
17	04.12.2021	79.42	33.58	10.33	14.12	0.86
18	06.12.2021	82.42	38.42	10.59	11.01	1.36
19	13.12.2021	62.63	32.58	12.45	10.98	1.19
20	17.12.2021	53.56	40.25	9.93	10.97	0.86
21	20.12.2021	78.15	33.57	10.11	11.16	1.06
22	23.12.2021	81.63	35.96	9.83	11.14	1.08
23	27.12.2021	53.54	27.12	12.63	11.12	1.53
24	28.12.2021	53.4	27.04	9.74	10.96	0.56
Min		**53.40**	**27.04**	**9.74**	**10.96**	**0.44**
Max		**84.56**	**44.63**	**13.14**	**15.40**	**1.72**
Avg.		**69.52**	**34.82**	**10.93**	**11.82**	**1.08**
98 percentile		**83.65**	**44.61**	**13.10**	**14.81**	**1.65**
NAAQS, For 24 hourly monitoring (except CO		100 µg/m3	60 µg/m3	80 µg/m3	80 µg/m3	2.0 mg/m3

for Eight hour)					

Table 3.14(e): Ambient Air Quality for the location AAQ5

S. No.	Date	Test Parameters				
		PM_{10} (µg/m^3)	$PM_{2.5}$ (µg/m^3)	SO_2 (µg /m^3)	NO_2 (µg /m^3)	CO (mg/m^3)
		IS:5182(Part-23)	CPCBVolume-1/ Gravimetric	IS:5182(Part-2)	IS:5182(Part-6)	IS:5182(Part-10)
1	04.10.2021	62.78	30.54	12.47	11.73	0.55
2	05.10.2021	58.27	40.22	9.78	11.66	1.63
3	12.10.2021	59.30	30.61	12.18	11.99	1.47
4	15.10.2021	60.61	29.49	11.72	12.36	0.84
5	19.10.2021	65.43	30.50	9.49	11.78	1.47
6	22.10.2021	58.64	32.63	11.73	12.16	1.58
7	26.10.2021	80.21	40.19	12.94	14.03	0.96
8	27.10.2021	58.56	30.67	9.67	10.42	1.24
9	03.11.2021	60.72	32.53	12.69	13.98	1.66
10	06.11.2021	80.24	29.46	11.70	11.89	0.87
11	11.11.2021	74.39	28.53	9.58	13.08	1.32
12	12.11.2021	61.62	30.49	12.96	10.35	1.44
13	18.11.2021	75.21	40.58	12.47	16.46	0.86
14	20.11.2021	79.66	31.73	9.63	15.88	1.75
15	25.11.2021	69.37	33.76	12.94	11..65	1.48
16	26.11.2021	66.39	29.64	12.29	16.23	0.33
17	04.12.2021	80.36	40.35	9.75	11.74	1.47
18	06.12.2021	67.43	30.52	11.32	14.67	1.75
19	13.12.2021	60.42	29.67	10.33	15.81	1.38
20	17.12.2021	80.32	28.66	9.85	13.78	1.69
21	20.12.2021	74.29	40.12	11.73	10.24	1.58
22	23.12.2021	63.33	30.31	12.63	14.32	0.98
23	27.12.2021	80.07	28.43	10.12	11.63	1.18
24	28.12.2021	60.53	31.84	9.63	13.98	0.96

Min	**58.27**	**28.43**	**9.49**	**10.24**	**0.33**
Max	**80.36**	**40.58**	**12.96**	**16.46**	**1.75**
Avg.	**68.26**	**32.56**	**11.23**	**13.05**	**1.27**
98 percentile	**80.34**	**40.47**	**12.95**	**16.36**	**1.75**
NAAQS, For 24 hourly monitoring (except CO for Eight hour)	100 µg/m3	60 µg/m3	80 µg/m3	80 µg/m3	2 mg/m3

3.4.1.3 Analysis of results

a. Particulate Matters (PM10 & PM2.5)

PM10 and PM2.5 were monitored using a Respirable Dust sampler (RDS) and PM2.5 Sampler. A pre-conditioned and weighted glass fibre filter paper is used for PM10 and PTFE filter paper is used for RDS/PM2.5 samplers. A known quantity of the air was sucked through the filter paper in a prescribed sampling time. The flow was noted from the manometer. The multiplication of time with rate gave the total quantity of air passed through the filter paper. After sampling, the filter paper was removed, conditioned and weighed finally for getting the concentrations in ambient air.

The minimum and maximum level of PM2.5 recorded within the study area was in the range of 26.01 µg/m3 (at AAQ1- Shahupura -01+200) to 49.47 µg/m3 (at AAQ3- Mohna -14+900). The minimum and maximum level of PM10 recorded within the study area in the range of 53.40 µg/m3 (at AAQ4- Failada Bangar -30+600) to 85.75 µg/m3 (at AAQ1- Shahupura -01+200). The 24 hourly average values of PM2.5 & PM10 were compared with the National Ambient Air Quality Standards (NAAQS) and found that all sampling stations recorded in the study area are within the applicable limits i.e., 60 µg/m3 for PM2.5 and 100 µg/m3 PM10.

b. Sulphur Di-Oxides (SO2)

A known quantity of the air was bubbled through impingers containing tetra chloromercurate. SO2, formed a disulfiltomercurate complex, which gave a pinkish blue color with p-rosaniline and formaldehyde solution. The intensity of color produced was proportional to concentration of Sulphur dioxide. The measurement was made by using spectrophotometer at the wavelength of 560 nm.

The minimum and maximum concentration of SO2 recorded within the study area was 8.16 µg/m3 (AAQ3- Mohna -14+900) to 13.14 µg/m3 (AAQ4- Failada Bangar -30+600).

The 24 hourly average values of SO2 were compared with the National Ambient Air Quality Standards (NAAQS) and it was found that all sampling stations recorded values are below the applicable limits 80 µg/m3 for rural areas.

c. Nitrogen Di-Oxides (NOx)

A known quantity of air was passed through impingers containing sodium hydroxide-sodium arsenite solution. The estimation of NOx was done calorimetrically using hydrogen peroxide, sulphanilamide, NEDA, etc. The intensity of the color was measured at 540 nm using a spectrophotometer. The minimum and maximum level of NO2 recorded within the study area was in the range of was 10.24 µg/m3 (AAQ5- Dayant Pur -31+100) to 16.78 µg/m3. (AAQ2- Panhera Khurd -08+800).The 24 hourly average values of NO2 were compared with the National Ambient Air Quality Standards (NAAQS) and it was found that all sampling stations recorded values are below the applicable limits 80 µg/m3 for rural areas.

d. Carbon Monoxide (CO)

NDIR based samplers are used to monitor the carbon monoxide levels. The minimum and maximum level of CO recorded within the study area was in the range of was 0.33 mg/m^3 (AAQ5- Dayant Pur -31+100) to 1.78 mg/m3. (AAQ2- Panhera Khurd -08+800).

3.4.1.4 Instrument Used for Sampling

Respirable Dust Samplers APM-250 of Lata Envirotech Services make were installed for monitoring Suspended Particulate Matter (SPM), Respirable fraction (<10 microns) and gaseous pollutants like SO2 and NOX whereas the concentration Particulate matter 2.5 was monitored by installing Envirotech made APM 50MFC particulate matter sampler.

3.4.1.5 Techniques for Ambient Air Quality Monitoring

The techniques used for Ambient Air Quality monitoring have been presented in Table 3.15.

Table 3.15: Techniques used for Ambient Air Quality Monitoring

Parameter	Technique	Technical Protocol
Suspended Particulate Matter	Respirable Dust Sampler (Gravimetric method)	IS-5182 (Part-IV)
Respirable Particulate Matter	Respirable Dust Sampler	IS-5182 (Part-IV)

	(Gravimetric method)	
PM 2.5	PM 2.5 APM 550 Fine Particle Sampler	
Sulphur Dioxide	West and Gaeke	IS-5182 (Part-II)
Oxides of Nitrogen	Jacob and Hochheiser	IS-5182 (Part-IV)
CO	Non – dispersive Infrared (NDIR) Spectroscopy	IS-5182 (Part-IV)

3.5 NOISE ENVIRONMENT

Noise can be defined as any sound that is undesirable because it interferes with speech and hearing, and is intense enough to damage hearing or is otherwise annoying. Noise impacts can be of concern during construction and operational phases of the project. Factors those are important in determining noise levels include distance from the noise source, natural or manmade barriers between the source and the receptors, whether conditions, etc.

3.5.1 Noise Standards

The Ambient Noise Quality Standards with respect to noise have been stipulated by Govt. of India vide Gazette Notification dt. 14.02.2000. Table 3.16 describes the Ambient Noise Standards.

Table 3.16: Ambient Noise Standards

Area Code	Category of Area	Limits in dB (A), Leq	
		Day time	Night time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone*	50	40

**Silence zone is defined as an area up to 100 meters around such premises as hospitals, educational institutions and courts. The silence zones are to be declared by the competent authority;*

3.5.2 Noise monitoring locations

An assessment of baseline noise quality was undertaken to (a) establish the status of exposure of the major sensitive receptors, and (b) to identify the noise pollution levels in and around the site. The noise monitoring was done following CPCB protocol of Noise Monitoring. The details of the Noise level monitoring locations have been presented in Table 3.17 and Figure 3.17.

Table 3.17: Noise level Monitoring Locations

S No	Notation	Location	Chainage	Lat	Long
1	ANL1	Shahupura	01+200	28°18'10.91"N	77°20'7.67"E
2	ANL2	Panhera Khurd	08+800	28°16'5.51"N	77°24'3.92"E
3	ANL3	Mohna	14+900	28°13'22.52"N	77°26'42.71"E
4	ANL4	Failada Bangar	30+600	28°12'50.82"N	77°32'57.67"E
5	ANL5	Dayant Pur	31+100	28°10'43.31"N	77°34'19.25"E
6	ANL6	Shahupura	01+200	28°18'10.91"N	77°20'7.67"E

Figure 3.16: Ambient Noise Monitoring Location

3.5.3 Noise quality Analysis along the proposed project

Observations noticed from the monitoring results summarized in Table 3.18 can be illustrated as:

Table 3.18: Noise quality Analysis report

S. No	Test Parameters	ANL1	ANL2	ANL3	ANL4	ANL5	Units	Requirement (as per CPCB Guidelines Limits in dB (A) Leq		
1.	L_{day} (6.0 AM TO 10.0 PM)	51.5	50.6	54.7	51.0	50.2	dB(A)	Category of Area/ Zone	Day Time	Night Time
								Industrial Area	75	70
2.	L_{night} (10.0 PM TO 6.0 AM)	38.7	41.8	38.2	35.5	34.6	dB(A)	Commercial Area	65	55
								Residential Area	55	45
								Silence Zone	50	40

3.5.3 Interpretation of results

The measured value for Leq-day & Leq-night has been found well within the prescribed limit.

3.6 SOCIAL ENVIRONMENT

3.6.1 Introduction

Construction of 6 lane Greenfield connectivity from DND-Faridabad-Ballabhgarh bypass (from km 32+600) to Jewar International Airport under Bharatmala Pariyojna (Lot-4/Pkg-1) in the State of Haryana and Uttar Pradesh. Proposed Length – 31.060 Km.

The project corridor passes through approx. 14 villages of Faridabad and Palwal district of Haryana and 05 villages of Gautam Buddh Nagar district of Uttar Pradesh.

3.6.1.1 Population

As per details from Census 2011, Haryana has population of 2.54 Crores, an increase from figure of 2.11 Crore in 2001 census. Total population of Haryana as per 2011 census is 25,351,462 of which male and female are 13,494,734 and 11,856,728 respectively.

As per details from Census 2011, Uttar Pradesh has population of 19.98 Crores, an increase from figure of 16.62 Crore in 2001 census. Total population of Uttar Pradesh as per 2011 census is 199,812,341 of which male and female are 104,480,510 and 95,331,831 respectively.

Its population growth rate over the decade 2001–2011 was 31.75%. Faridabad has a sex ratio of 873 females for every 1000 males, and a literacy rate of 83%.

The Faridabad district decadal population growth is 31.75% and Palwal district is 25.49% district of Haryana and Gautam Buddha Nagar district decadal population growth is 37.11% district of Uttar Pradesh.

The Haryana State child population (0-6 age) is 3,380,721 in 2011 compared to 3,335,537 in 2001.

The Uttar Pradesh State child population (0-6 age) is 30,791,331 in 2011 compared to 31,624,628 in 2001.

The decadal growth rate of population of the Faridabad district is 31.75 percent and Palwal District is 25.49 percent and, Gautam Buddha Nagar District is 37.11 percent.

Table 3.19: Percentage Decadal Variation in Population for State and Districts: 2001-2011

Districts/State	2001-11 (%)
Faridabad	31.75
Palwal	25.49
Gautam Buddh	37.11

Nagar	
Haryana	19.90
Uttar Pradesh	20.20
India	17.64

Source: Census 2001- 2011

3.6.1.2 Population Density

Haryana is a State of India with population of Approximate 6.86 Crores. The population of Haryana state is 68,548,437. The density of Haryana state is 200 per sq km. Haryana State is spread over 342,239 Sq Km. The district has a population density of 476 Persons per sq Km. and istrict population density of 595 Persons per sq Km. The national population density is 324 persons per Sq. Km. which shows that the population density is lesser than the national level. The density of Haryana state in the current decade is 1485 per sq mile. Haryana is an State of India with population of Approximate 2.54 Crores. The population of Haryana state is 25,351,462.

The Faridabad district has a population density of 2,442 inhabitants per square kilometer, Palwal district has a population density of 770 inhabitants per sq Km and Gautam Buddha Nagar district has a population density of 1,161 inhabitants per sq Km.

The national population density is 324 persons per Sq. Km. which shows that the population density is lesser than the national level.

Table 3.20: Population Density for State and District: 2011

District	Population Density (persons per sq. km.)
	2011
Faridabad	2,442
Palwal	770
Gautam Buddh Nagar	1,161
Haryana	573
Uttar Pradesh	828
India	324

Source: Census 2011

3.6.2 Sex Ratio

In 2011, the sex ratio in Haryana state is 877 females for each 1000 males, which is slightly improvement over the last decade of 861 females for each 1000 males in 2001. The child sex ratio stood at 834 females per 1000 males in 2011, with a decline from 819 females' children per 1000 male's children in 2001 and sex ratio in Uttar Pradesh state is 912 females for each 1000 males, which is slightly improvement over the last decade of 898 females for each 1000 males in 2001. The child sex ratio stood at 902 females per 1000 males in 2011, with a decline from 916 females' children per 1000 male's children in 2001.

Table 3.21: Sex Ratio (No of Female out of 1000 Male) for State and Districts: 2001 - 2011

Years	2001	2011
Faridabad	826	873
Palwal	862	880
Gautam Buddha Nagar	841	851
Haryana	861	877
Uttar Pradesh	898	912
India	933	943

Source: Census 2011

The sex ratio of Faridabad, Palwal, & Gautam Buddha Nagar district has decreased in 2011 as compared to 2001 census.

3.6.3 Literacy Rate

Literacy rate in Haryana has seen upward trend and is 75.55 percent as per 2011 population census. Of that, male literacy stands at 84.06 percent while female literacy is at 65.94 % and Literacy rate in Uttar Pradesh has seen upward trend and is 67.68 percent as per 2011 population census. Of that, male literacy stands at 77.28 percent while female literacy is at 57.18 percent.

Table 3.22: Number of Literates and Literacy Rate for State and Districts: 2011

State / Districts	Number of Literates*			Literacy Rate (%)		
	Persons	Male	Female	Persons	Male	Female
Faridabad	1,272,739	7,34,940	5,37,799	81.70	66.61	73.84

Palwal	5,99,796	3,79,696	2,20,100	69.32	82.66	54.23
Gautam Buddha Nagar	11,22,947	6,66,065	4,56,882	80.12	88.06	70.82
Haryana	16,598,988	9,794,067	6,804,921	75.55	84.06	65.94
Uttar Pradesh	11,43,97,555	6,82,34,964	4,61,62,591	67.68	77.28	57.18
India	763638812	434763622	328875190	72.98	80.88	64.63

Source: Census 2011

**Literates exclude age group 0-6 years that were by definition in the Census of India 2011*

Among all the three districts, Faridabad has the highest literacy rate of 81.70 % and the highest female literacy rate of Faridabad district is 73.84 %.

3.6.4 Work Participation Rate

In 2011, the Workforce Participation Rate at all India level is 25.51% for females and 53.26% for males. While there is no rural–urban gap for males (53%), there is considerable rural- urban gap for females (rural -30%, urban- 15.4%).

Table 3.23: Workforce participation Rate

State	Rural		
	Persons	Male	Female
Faridabad	32.01	49.37	12.13
Palwal	29.69	43.55	13.95
Gautam Buddha Nagar	34.53	49.81	16.59
Haryana	35.17	50.44	17.79
Uttar Pradesh	16.75	47.71	32.94
India	39.1	51.7	25.7

Source: Census 2011

Gautam Buddha Nagar district recorded highest work participation rate of 35.17 percent and occupies top position in the other Districts.

Women's work participation in Gautam Buddha Nagar district is 15.05 % more than women's work participation in Faridabad & Palwal districts.

3.6.5 Employment Pattern

The Census 2011 further classifies the workers (both main and marginal) into four classifications namely cultivators, agricultural laborers, household industries and other workers. The four-fold classification revealed that there was a declining share of the cultivators and household industry but increasing share of the worker in agricultural laborers and other type of worker.

Table 3.24: Employment Pattern of Main + Marginal Worker in Districts of Haryana and Uttar Pradesh

Industry Classification	Haryana & % share	Uttar Pradesh & % share	Faridabad &% share	Palwal &% share	Gautam Buddha Nagar &% share
Cultivators	2,480,801 (27.82 %)	1, 90, 57,888 (28.96 %)	27,705 (4.78 %)	91,506 (29.56 %)	72,668 (12.77 %)
Agricultural Laborers	1,528,133 (17.14 %)	1, 99, 39,223 (30.3 %)	29,288 (5.06%)	60,685 (19.60%)	48,845 (8.58 %)
Workers in household industry	2,62,280 (2.94 %)	38,98,590 (5.92 %)	32,286 (5.57 %)	8,566 (2.77 %)	35,400 (6.22 %)
Other Workers	4,645,294 (52.1 %)	2, 29, 19,014 (34.82 %)	4,89,950 (84.59 %)	1,48,806 (48.07 %)	4,12,196 (72.43 %)

Source: Census 2011

3.6.6 Demographic Profile of the Project Influence Area

The project corridor transverses through approx. 14 villages of Faridabad and Palwal district of Haryana and 05 villages of Gautam Buddh Nagar district of Uttar Pradesh Tehsil-wise distribution of Project affected villages is presented in Table below.

Table 3.25: List of Affected Villages

Sl. No.	State	District Name	Tehsil Name
1	Haryana	Faridabad	**1. Ballabhgarh** Villages: Chandawali, Shahupura, Sotai, Behbalpur, Phophunda **Sub-Tehsil**-Mohna Villages: Panehra Khurd, Narhawali, Mahmadpur, Hirapur, Mohna, Mohiyapur, Chhainsa.

		Palwal	**2. Palwal** Villages: Bagpur Kalan, Jhuppa.
2.	Uttar Pradesh	Gautam Buddh Nagar	**3. Jewar** Villages: Falaida Khadar, Falaida Bangar, Karauli Bangar, Dayanat Pur, Ballabh Nagar Urf Karol Bangar

Source: published schedule (3A)

The socio-economic profile for all the villages within the project corridor has been carried out based on Census of India 2011 and summarized in Table below:

Table 3.26: Demographic Profile of the Project Affected Villages

S. No.	Description	Number	% to total
1	Total Population - Gender wise	77697	100
	Male	41685	53.7
	Female	36012	46.3
	Sex ratio (No. of females per 1000 males)	863	
2	Total Population (0-6 years) - Gender wise	12784	100
	Male	6927	54.2
	Female	5857	45.8
	Sex ratio (No. of females per 1000 males)	845	
3	Total Population (Sector Wise)	77697	100
	Rural	77697	100
	Urban	-	-
4	Total No. of Households	13692	
	Average House hold size	-	6
	Lowest Household size	-	5
	Highest Household size	-	7
5	Total SC & ST Population	16102	100
	Total Population (SC)	16102	20.72
	Total Population (ST)	0	0
6	Total Literates – Gender wise	46196	100
	Male Literacy (with respect to the male population)	28980	62.7
	Female Literacy (with respect to the female population)	17216	37.3

	Overall Literacy rate in the study area	59.45	
7	Total Workers & Work Participation Rate	25002	100
	Male (Number and % with respect to the male population)	18787	75.1
	Female (Number and % with respect to the female population)	6215	24.9
	Gender gap in workforce (in percentage)	33.8	
8	Total Main Workers & percentage to total worker	17605	100
	Male (Number and % with respect to the male working population)	14827	84.2
	Female (Number and % with respect to the female working population)	2778	15.8
a)	Main Worker as Cultivator (Number and Percentage)	6481	8.34
b)	Main Worker as Agricultural Labour (Number and Percentage)	2876	3.70
c)	Main Worker as Household Industry Worker (Number and Percentage)	1042	1.34
d)	Main Worker as Other workers (Number and Percentage)	7206	9.27
9	Total Marginal Workers & percentage to total worker	7397	100
	Male (Number and % with respect to the male working population)	3960	53.5
	Female (Number and % with respect to the female working population)	3437	46.5
a)	Marginal Worker as Cultivator (Number and Percentage)	1171	1.50
b)	Marginal Worker as Agricultural Labour (Number and Percentage)	3085	3.97
c)	Marginal Worker as Household Industry Worker (Number and Percentage)	786	1.01
d)	Marginal Worker as Other workers (Number and Percentage)	2355	3.03
10	Number and Percentage of Marginal Worker (3-6 Months)	6160	7.92
11	Number and Percentage of Marginal Worker (0-3 Months)	1237	1.59

3.6.7 Conclusion

On the basis of interpretation made above, based on secondary data, the major outcomes specify the following observations and gap in the study area:

- Average literacy rate of the project corridor is approximately 59.45% whether as male literacy is 62.7% and female literacy rate is 37.3%.
- The composition of Schedule Caste (SC) in total population is 20.72 % and Schedule Tribe (ST) is 0.00%.
- Work Participation Rate of the study area is 32.17% in which males are 75.1 % and females are 24.9%, creating a gender gap of 33.8%. Among the total workers, 22.65% are main workers and rest 9.52% are marginal worker.

3.7 BIOLOGICAL ENVIRONMENT

Biological diversity comprises the variability of species, genus and ecosystems and is very crucial for maintaining the basic processes on which the life depends. Broadly it can be divided in to two types i.e. the floral diversity and faunal diversity. Conservation of the biodiversity is essential for the sustainable development as it not only provides the food, fodder and medicine but also contribute in improvement of essential environmental attributes like air, water, soil, etc.

Before starting any Environmental Impact Assessment study, it is necessary to identify the baseline of relevant environmental parameters which are likely to be affected as a result of operation of the proposed project. A similar approach has been adopted for conducting the study on Biological Environment for this Project. Both terrestrial and aquatic ecosystems have been studied to understand the biological environment.

During the present works and site visits Some of most common plant species which occurred in study area Neem (Azadirachta indica), Bakain (Melia azedarach), Bargad (Ficus benghalensis), Peepal (F. religiosa), (Mangifera indica), Ailanthus excelsa, Murraya koenigii, Bael (Aegle marmelos), Eucalyptus sp., Arjuna (Terminalia arjuna), Polyalthia longifolia, (Butea monosperma), Sissoo (Dalbergiasissoo), Amaltas (Cassia fistula), Amrud (Psidium guajava), Jamun (Syzygium cumini), Acacia nilotica, Acacia arabica, Albizia lebbeck, Derris indica, Sehtut (Morus alba), Zizyphus nummularia, Alstonia scholaris etc. Some plant species are exotic and show dominancy in this area; these are Parthenium hysterophorus, Eichhornia crassipes, Lantana camara etc.

Study period and methodology

Detailed survey was conducted to evaluate floral and faunal composition of the study area. Primary data on floral and faunal composition was recorded during site visit and secondary data was collected from the Forest department and published relevant literature. Inventory of flora and fauna has been prepared on the basis of collected data.

Methodology:

Table: Mode of data collection & parameters considered during the survey

Aspect	Data	Mode of data collection	Parameters monitored
Terrestrial Ecology	Primary data collection	By conducting field survey	Floral and Faunal diversity
	Secondary data collection	Authentic sources like Haryana Forest department of Ambalaand available published literatures	Floral and Faunal diversity and study of vegetation, forest type, importance etc.
Aquatic Ecology	Primary data collection	By conducting field survey	Floral and Faunal diversity
	Secondary data collection	Authentic sources like Haryana Forest department of Ambala and available published literatures	Floral and Faunal diversity and study of vegetation, forest type, importance etc.

3.7.1. Flora of the study area

On the bunds of the agricultural land and along the road side, growth of weeds like Argemone mexicana, Cannabis sativa, Cenchrus ciliaris, Heteropogoncontortus, Lantana camara, Parthenium hysterosphorus, etc. are very common. These weeds are affecting the agricultural productivity of the region due to fast growth, short life cycle and enormous production of seeds.

Vegetation in and around human settlement:

Vegetation pattern in villages and surrounding areas are slightly different from the rest of the areas. The common species grown near villages are mostly edible or useful plants such as Syzygium cumini, Azadirachta indica, Eucalyptus sp. Albizia lebbeck, Delonix regia, Populus deltoides,Tamarindus indica, etc.

A list of flora of the study area is enclosed as Table

Flora of the Study Area

Trees of the study area

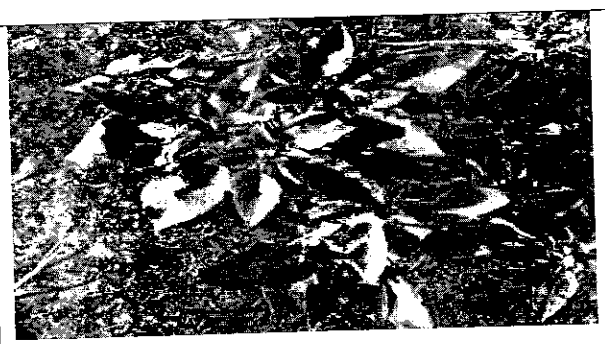
Sl.No	Botanical Name	Family
1.	*Acacia catechu*	Fabaceae
2.	*Aegle marmelos*	Rutaceae
3.	*Albizia lebbeck*	Fabaceae
4.	*Albizia procera*	Fabaceae
5.	*Azadirachta indica*	Meliaceae
6.	*Bauhinia acuminata*	Fabaceae
7.	*Bauhinia variegata*	Fabaceae
8.	*Bombax ceiba*	Malvaceae
9.	*Butea monosperma*	Fabaceae
10.	*Cassia fistula*	Fabaceae
11.	*Celtis australis*	Cannabaceae
12.	*Dalbergia sissoo*	Fabaceae
13.	*Delonix regia*	Fabaceae
14.	*Emblica officinalis*	Phyllanthaceae
15.	*Ficus religiosa*	Moraceae
16.	*Grewia optiva*	Tiliaceae
17.	*Leucaena leucocephala*	Fabaceae
18.	*Mangifera indica*	Anacardiaceae
19.	*Melia azedarach*	Meliaceae
20.	*Morus alba*	Moraceae
21.	*Murraya koenigii*	Rutaceae
22.	*Polyalthia longifolia*	Annonaceae
23.	*Syzygium cumini*	Myrtaceae
24.	*Terminalia arjuna*	Combretaceae
25.	*Boswellia serrata*	Burseraceae
26.	*Erythrina suberosa*	Fabaceae
27.	*Anogeissus latifolia*	Combretaceae

Herb and Shrub of the Study area

Sl.No.	Species	Family	Habit
1.	*Ageratum conyzoides*	Asteraceae	Herb
2.	*Parthenium hysterophorus*	Asteraceae	Herb
3.	*Cassia tora*	Fabaceae	Herb
4.	*Cannabis sativa*	Cannabaceae	Herb
5.	*Argemone mexicana*	Papaveraceae	Herb
6.	*Brachiaria ramosa*	Poaceae	Herb
7.	*Cynodon dactylon*	Poaceae	Herb
8.	*Eleusine indica*	Poaceae	Herb
9.	*Eragrostistenella*	Poaceae	Herb

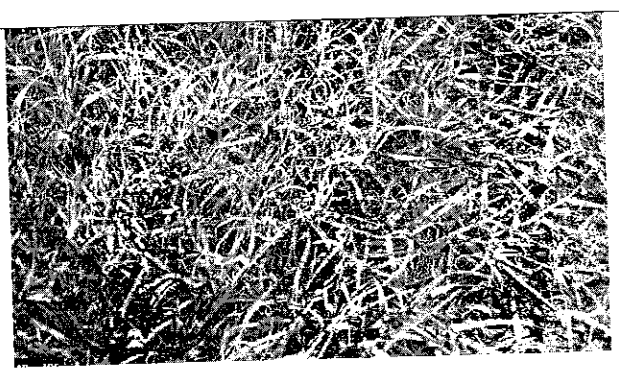
Sl.No.	Species	Family	Habit
10.	*Imperata cylindrica*	Poaceae	Herb
11.	*Saccharum spontaneum*	Poaceae	Herb
12.	*Calotropis procera*	Asclepiadaceae	Shrub
13.	*Cassia occidentalis*	Fabaceae	Shrub
14.	*Bougainvillea spectabilis*	Nyctaginaceae	Shrub
15.	*Ziziphus mauritiana*	Rhamnaceae	Shrub
16.	*Solanum virginianum*	Solanaceae	Shrub
17.	*Lantana camara*	Verbenaceae	Shrub
18.	*Datura stramomium*	Solanaceae	Shrub

Calotropis procera (Aak)



Datura stramomium

Argemone mexicana (satyanashi)



Cynodon dactylon (Dub)

3.7.2 WILD LIFE AND AVIFAUNA OF THE STUDY AREA:

The major part of the study area lies under agriculture field and small roads (vide Land use map)which restrict the wildlife habitat significantly. No wild mammalian species encountered during the field visit to study area, while livestock of local people are significantly using the area.

After a potential search, neither any direct sighting nor the indirect evidences were found in whole study area. A list of wild fauna of the study area has been prepared on the basis of local inquiry from the village people and from the available published literatures. The conservation value at regional level of identified fauna was gathered from the Wildlife protection Act, 1972 moreover, global conservation status of species was estimated from Red data book of IUCN was used. No established habitats of any mammals or birds are noticed in river bed and along the banks.

Fauna:

Mammals:the core zone of the study area is not rich in wild mammals, but many domesticated mammal species are reported from buffer zone during the field survey. Common grazing animals like buffalo, cow, goat etc. are noticed in open grass fields. Small mammals like Indian palm squirrel (*Funambulus palmarum*) and field mouse (*Apodemus sylvaticus*) are noticed in vicinity of village. Inquiry from village people regarding wild animals reveals that Rhesus macaque *(Macaca mulatta)*, Indian hare (*Lepus nigricollis*), fruits bat (*Pteropus conspicillatus*), etc. are often seen in the area.

Avifauna: Water birds like White throated Kingfisher (*Halcyon smyrnensis*), Pied Kingfisher (*Ceryle rudis*), Red Wattled Lapwing, Indian Cormorant, *etc.* are noticed. House crow (*Corvus splendens*), House sparrow (*Passer domesticus*), Common Myna (*Acridotheres tristis*), *Gracula religiosa*) of common occurrence.

Reptiles: The reptilians species commonly reported are Agama (*Laudakia tuberculata*) in settlement area, Garden lizard (*Calotes versicolor*) and *Eutropis macularia* along shady places in agricultural field or where growth of bushes is noticed. Among non poisonous snakes rat snakes (*Ptyas mucosus*) are commonly noticed in field, followed by poisonous snakes like Indian Cobra (*Naja naja*) and Banded krait (*Bungarus multicinctus*) are reported to be seen by farmers.

Amphibian: Amphibians are commonly found at the places along the margin of aquatic and terrestrial systems (bhakhra main canal). Due to presence of water bodies like river, nalas, (bhakhra main canal) etc. the study area is providing shelter to many amphibian species. Some of the commonly reported species are *Bufo melanostictus* (common Indian toad),*Euphlyctis cyanophlyctis* (Indian skipper frog).

Fish: The fish species which are commonly found in the proposed site are (bhakhra main canal) *Labeo bata* (Bhangan or Bata), *Gudusia chapara* (Chappera or Palla), *Labeo rohita* (Dumra or Dhambra), *Notopterus notopterus* (Pari or Battu),*Catla catla* (Theila) etc.

A list of Fauna of the study area is presented in table given below.

Fauna of the Study Area.

S.No.	Zoological Names (Fauna)	Common Name	WPA, 1972
1.	*Boselaphus tragocamelus*	Nilgai	Schedule-III
2	*Canis aureus*	Gidar, Jacal	Schedule-II
3	*Felis chaus*	Jungli cat	Schedule II
5	*Funambulus pinnati*	Gilhari	Schedule-IV
7	. *Herpestes edwardsii*	Newla	Schedule-II
9	*Hystrix indica*	Sehi	Schedule-IV
10	. *Lepus nigricollis dayanus*	Khargosh	Schedule-IV
12	*Millavdia meltada*	Jungli musa	Schedule-V
14	*Mus-masculus*	Gharelu musa	Schedule-V
16	*Rattus rattus*	Gharelu musa	Schedule-V
18	*Rousettus leschenaultia*	Chamgadar/ Fruit bat	Schedule-V
19	*Macaca mulatta*	Rhesus Macaque	Schedule-II

Domestic Animals in Study area

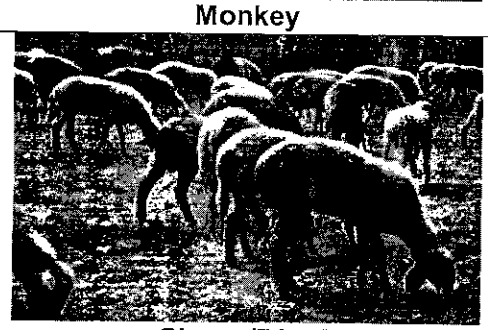
S.No.	English/Hindi Name	Scientific Name
1	Buffalo/ Bhains	*Bulbalus bulbalis*
2	Chicken/Murga	*Gallus gallus domesticus*
3	Cow/Gai	*Bos primigenius*
4	Dog/Kutta	*Canis lupus familiaris*
5	Goat/Bakri	*Capra aegagrus hircus*
6	Sheep/Bhed	*Ovis aries*

7	Camel/Oont	*Camelus dromedarius*


Cow


Monkey


Dog


Sheep/Bhed

Avi fauna

S.No.	Common Name	Scientific name	WPA-1971	IUCN Red Category
1.	Jungle Myna	*Acridotheres fuscus*	IV	LC
2.	Bank Myna	*Acridotheres ginginianus*	IV	LC
3.	Common Myna	*Acridotheres tristis*	IV	LC
4.	CommonTeal	*Anascrecca*	IV	LC
5.	House Swift	*Apusaffinis*	IV	LC
6.	Common Swift	*Apusapus*	IV	LC
7.	Grey Heron	*Ardea cinerea*	IV	LC
8.	Indian Pond Heron	*Ardeola grayii*	IV	LC
9.	Cattle Egret	*Bubulcus ibis*	IV	LC
10.	Pied Kingfisher	*Ceryle rudis*	IV	LC
11.	Rock pigeon	*Columba livia*	IV	LC
12.	House Crow	*Corvus splendens*	V	LC
13.	Black Drongo	*Dicrurus macrocercus*	IV	LC

S.No.	Common Name	Scientific name	WPA-1971	IUCN Red Category
14.	House Sparrow	*Passer domesticus*	IV	LC
15.	Scarlet Minivet	*Pericrocotus flammeus*	IV	LC
16.	Red-vented Bulbul	*Pycnonotus cafer*	IV	LC
17.	River Tern	*Sterna aurantia*	IV	LC
18.	Spotted Dove	*Streptopelia chinensis*	IV	LC
19.	Jungle Babbler	*Turdoides striatus*	IV	LC
20.	Common Hoopoe	*Upupa epops*	IV	LC
21.	River Lapwing	*Vanellusduvaucelii*	IV	LC
Reptiles & Amphibians				
1	Common Toad	*Duttaphrynus melanostictus*	IV	NA
2	India bull frog	*Ranatigrina*	IV	DD
4	Garden lizard	*Calotes versicolor*		NA
5	House lizard	*Hemidactylussp*	IV	NA
6	Rat snakes	*Ptyas mucosa*	II	NA
Fishes				
1	Bhangan or Bata	*Labeo bata*		NA
2	Dumra or Dhambra	*Labeo rohita*		NA
3	Theila	*Catla catla*		NA

LC: Least Concern, NA: Not Assessed, DD: Data deficient.

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CHAPTER 4: POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

4.1 INTRODUCTION

This section identifies and assesses the potential impacts on different environmental parameters due to planning and design, construction and the operation of the proposed road development. After studying the existing baseline environmental scenario, analysing project activities, initial field surveys, reviewing the process and related statutory norms, the anticipated potential adverse impacts have been identified and assessed for design, construction and the operation phases. Potential positive impacts or improvements have also been reviewed. The appropriate mitigation measures have been formulated to limiting the anticipated potential adverse impacts to acceptable levels for each stage of the project. The potential impacts and their suitable mitigation measures are described here.

4.1.1 Project Influence Area

Direct Corridor of Impact (COI) is within toe lines, except for noise sensitive receptors such as education and health institutes which is considered up to 100 m on either side. General corridor of impact is up to 300 m on either sides of the project road, wherein ecologically sensitive areas such as national park, wildlife sanctuary, reserve and protected forests, major water bodies (including downstream water quality of flowing water bodies) etc. have been observed. Ancillary sites such as borrow area, quarry site, waste disposal sites and construction campsites.

4.1.2 Impacts Identification

Positive Impacts

Rehabilitation and Strengthening of existing project road will have following positive environmental impacts:

Reduction of travel time for traffic along major route;

Reduction of vehicle operating cost including fuel cost, and saving national economy;

Improved drainage condition, and reducing flooding at submergence section; and

Stimulating economic development by providing better accessibility between remote part of the State and the State capital.

4.1.3 Adverse Environmental Impacts

Road up-gradation related adverse impacts occur at three stages of the project:

- Planning and Design phase
- Construction phase
- Operation phase

Planning and Design covers the road alignment, drainage provision, materials of construction, roadside amenities etc. that ultimately decides the impact during later phases. Most of the anticipated impacts are expected during construction and operation phase. While some of the construction phase impacts will be temporary, some are expected to be of longer term or permanent. Operation phase impacts will be continuous in nature or long term.

Environmental impacts were identified and screened during screening stage of this project. Environmental parameters for road sector project, "non-significant impacts" have been screened out from those with significant adverse impacts (if any).

Various environmental impacts identified for this sub-project are mentioned below:

Physical Environment

Impact on land use

Impact due to collection of construction material

Impact due to soil erosion and sedimentation

Impact on drainage and water logging

Impact on water resources

Impact on ambient air quality

Impact on noise environment

Ecological Environment

Impact on ecologically sensitive area

Impact on road side plantation

Impact on flora and fauna

Socioeconomic Environment

Impact on cultural properties

Impact on common property resources (CPRs)

Impact on residential properties

Impact on commercial properties

The environmental impact issues or attributes as mentioned above were identified based on the existing environmental conditions in the project areas and project interventions under the

project. The actual and potential impacts on above attributes due to this subproject is discussed subsequently in this section.

Table 4.1: Checklist of Impacts due to the Proposed Project

Project Phase / Environmental Impact	Impact		No Change	Short Term	Long Term
	+ve	- ve			
Impacts due to Project Location					
Loss of Land and Trees				*	*
Loss of Infrastructure				*	*
Public Utilities			*		
Cultural Properties			*		
Risk Due to Earthquake			*		
Impacts due to Construction					
Change of land use	*				*
Soil erosion at construction sites		*		*	
Pollution by construction spills			*		
Health risks & Cultural Hazards			*		
Dust Problem		*		*	
Noise Pollution		*		*	
Disturbance to traffic		*		*	
Effect on Economic Activities		*		*	
Impacts due to Project Operation					
Noise Pollution			*		
Traffic Disturbance	*				*
Odour Problem			*		

Project Phase / Environmental Impact	Impact		No Change	Short Term	Long Term
	+ve	- ve			
Release of Treated Effluent			*		
Positive Impacts					
Health Benefits	*				*
Improved Aesthetics	*				*
Better infrastructure facilities	*				*
Improved Air Quality	*				*
Increased Socio-economics	*				*
Increased Agricultural activity	*				*
Employment Opportunity	*				*

4.1.4 Approach to mitigation measures

The road design, construction activities and operation can have various levels of environmental impacts and corresponding mitigation measures could be formulated. The approach to mitigation measures has been in the following order:

- Avoiding adverse impacts by integrating environmental issues into project design;
- Minimising adverse impacts by design modification and adopting mitigation measures;
- Compensating adverse impacts for those which could neither been minimized nor avoided
- The anticipated potential adverse environmental impacts and corresponding mitigation measures, for each stage of the project, are discussed in the following paragraphs.

4.2 AIR ENVIRONMENT

Besides, direct impacts of three phases of any road development project, the growth of towns or cities taking place along the main national or state highway also results in impacting the ambient environment along the road. Such ribbon development on one hand adds to the pollution load all along the corridor and on the other, it impact proves being abject to receptors the road.

Motor vehicles have emerged as one of the most important source of vehicular air pollution espccially in urban area. The road development projects like this are aimed at to enhance the efficiency of road transport system and there by the vehicle number plying on such corridor increases absolutely, so impact assessment on ambient air environment is among the most significant impacts of all such projects.

Air quality all along the project corridor will be impacted during all the three phases of the project i.e., pre-construction, construction and post construction (operational) phase. The operational stage impacts though may not be as serve terms of dust level as that of construction phase impacts, which are localized and temporary. The impacts during this phase will be of a long-term nature and the intensity will be confined to the band of width of 75m to 100m from the edge of RoW on the both side of the corridor depending up wind direction. However, both the construction and operational stage impacts can be effectively mitigated if the impacts are correctly assessed at the design stage itself and adequate mitigation measures are delineated and properly implemented. Impacts due to the construction activities will be higher nearer to the construction sites and asphalt mixing plants. Movement of vehicles carrying construction materials are also a source of air pollution and it is severe because their movement will be mostly on unpaved roads.

Particulate Matter levels at the various settlements locations could be of concern if they cross the standards for residential areas. Mitigation measures have to be worked out to decrease the Particulate Matter concentrations near sensitive areas.

4.3.1 Nature and Characteristics of Pollution Sources

a. Pre-construction Phase

The pre-construction stage activities include site clearance, shifting of various obstruction including ancient trees falling within proposed carriageway, transportation of men and material, construction of labour colonies, offices, material storage and maintenance yards etc. Besides it also focuses on the proper selection of borrow pits and other sources of raw materials for (aggregates) supplier and establishment of transport roads etc.

Typical pre-construction tasks during this phase include:

- Use of heavy vehicles and machinery etc. during site clearance and for trees obstruction and shifting of centre.

- Men and material transportation to the construction sites and installing camps and yard.
- Organization and construction of approach road for transport of earth from borrow pits/ quarries to construction site in the prc-construction phase.

Use of Fly Ash

Fly ash is available from NTPC Thermal power plant, which is close to the proposed project and located within 15 km.

Use of Aggregate

A reconnaissance survey was carried out along the entire stretch of highway and identified 01 stone metal quarries are listed in Table 4.2, samples of these quarries have been collected from their respective crushers. Samples of various sizes of aggregate dust have been collected from each of the crusher separately.

Table 4.2: Details of Aggregates Quarries

S No.	Village	Dist. From project road (Km)
1	From Hathipura	24.64

Use of Sand

River is the main source of natural Sand. Sand source locations are tabulated below Table 4.3. One sample from each source was collected during the material investigation work and the following tests have been conducted in the laboratory: Sieve Analysis and calculation of Fineness Modulus.

Table 4.3: Details of Sand Quarries

S No.	Village	Dist. From project road (Km)
1	Fine Sand from local to project site	-
2	Coarse sand from Bangana river	30

Dust during such activities would be the predominant pollutant during pre-construction stage and particularly so in case the pre-construction tasks are per found during dry summer or during pre-monsoon season.

But the impacts will be confined to specific location of stockyards labour colonies, width of RoW. Not all such impacts are confined, as these locations shall shift throughout the project road as the program progresses. Thus, the magnitude of impacts cannot be quantified because they will be location specific.

It may be pertinent to mention that such impacts could be significant on new alignments (One new by-passes) because disturbance and these activities without precaution can become adverse impacts because virgin area and agricultural fields are involved.

Mitigation Measures

- However, preventive action measures such as proper sprinkling of water on ROW around sites where pre-construction activities concerning site clearances are being undertaken.
- Covering all the material being transported in trucks especially carrying filling materials such as earth aggregates sand, should be adequate to mitigate the impacts during pre-construction. All such activities may generate dust but the level of activities at a single location will not be intensive to cause any significant adverse health impact.

b. Construction Phase

During construction stage the most predominated air pollutant would be:

- Particulate matter along with various other gaseous pollutants due to different type of fuels used (in different types of vehicles, and in toxic construction equipment, domestic fuel in construction/ labours camps etc.) along with certain other hazardous emission which are highly toxic pollutants from hot mix plants and leakage/ spillage of hazardous chemical used during construction.
- Dust and other pollutants generation will be high on the road stretches (under construction), and around construction yards/ plants etc. due to different construction activities including:
- Asphalt mix plant generating emission of various hazardous toxic pollutants due to heating and mixing of aggregate with bitumen.

- Material storage, transportation and handling (loading/unloading) of different construction materials such as sand, fly ash, earth from borrow bits, aggregate from stone quarries etc.
- Stone-crushing operation in the aggregate yards.
- Construction and other allied activities particularly more intensive on new bypass (new alignments for borrow pits).
- Concrete batching plants.

Mitigation Measures

- Road should be designed in such as manner that no traffic congestion in the populated area along the road.
- Vehicles carrying loose particles like sand and fine aggregates shall be covered to reduce spills on existing road.
- Water may be spread on earthworks, on a regular basis.
- During and after compaction of the sub-grade, water will be sprayed at regular intervals to prevent dust generation.
- All slopes and embankments will be turfed to minimize dust generation during operation of the road.
- Sprinkling water will control fugitive dust emissions. Regular maintenance of machinery and equipment will be carried out.

c. Operational Phase

However, during construction phase, the major air pollutant of concern was particulate matter, but during operational stage:

- Dust generation from vehicular movements on high way roads are primarily confined to diesel powered vehicles besides toxic dust emission for vehicular tyres.
- Further road side dust will have minor impact on surrounding environment as road shoulder has been proposed unpaved.
- The toxic dust emission form diesel vehicles as well as due to abrasive action of tyres on roads shall continue to pollute the project corridor.
- The severity of impact of gaseous pollutants due to vehicles plying on the highway at any given time shall depend upon the traffic volume emission rates of auto exhausted

pollutants and prevailing metreological condition within the project corridor. However, such emission is a part and parcel of an overall infrastructural (roads and transport system) development process and efficiency augmentation of transport system.

4.2.2 Prediction of Impact on Ambient Air Quality

To assess the impact on air quality of the project area during operation phase, air pollution dispersion modelling was carried out using future traffic projections. The modelling was carried out using CALINE-4, line source model developed by the California Transport Department. Carbon monoxide (CO) is the main component of the vehicular pollution. So, prediction of CO concentration is representative of the impacts of air pollution due to traffic movement.

CALINE - 4 Model

The air dispersion model used is CL4 (A Graphical User Interface for CALINE4) developed by the California Department of Transportation (Caltrans) for predicting air pollutant concentrations near roadways. CALINE4 is a simple line source Gaussian plume dispersion model. CALINE4 is a model based on the Gaussian diffusion equation and employs a mixing zone concept to characterize pollutant dispersion over the roadway. The purpose of the model is to assess air quality impacts near transportation facilities. Given source strength, meteorology and site geometry, the model can predict pollutant concentrations for receptors located within 500 meters of the roadway. It also has special options for modelling air quality near intersections, street canyons and parking facilities.

CALINE4 divides individual highway sections into a series of elements from which incremental concentrations are computed and then summed to form a total concentration estimate for a particular receptor location. Downwind concentrations from the element are modelled using the crosswind FLS (Finite Line Source) Gaussian formulation, but óy and óz are modified to consider the mechanical turbulence created by moving vehicles and the thermal turbulence created by hot vehicle exhaust in the region directly over the highway, region considered as a zone of uniform emissions and turbulence.

Input Data Requirement:

- Emissions

The emissions are provided by traffic volume (vehicles/h) and emission factor (gr/mile/vehicle) for each section.

• Meteorology

Wind speed Wind direction Wind direction standard deviation Atmospheric stability Class Mixing Height Ambient Temperature.

The details of input parameters considered for the modelling exercises are presented in the following paragraphs.

• **Traffic Data**

The traffic surveys have been carried out along the corridor to establish base year traffic with reference to traffic movements. Average hourly traffic data has been considered for the present modeling exercises.

• **Meteorological Data**

"Worst case wind angle" run type was considered to predict the worst-case scenario.

The met inputs entered were:

- Wind speed: m/s
- Stability Class:
- Mixing Height:
- Standard Deviation:
- Ambient Air Temperature:

4.2.2.1 Mitigation Measures:

- By having a better road surface during operational stage of this project the toxic dust from vehicular tyres shall be less.
- However, compliance of future statuary regulatory requirements and policy plan with respect to emission limits, auto-technology, vehicular fuel quality (including adulteration etc.) which is a dynamic process and charges with economic development along with implementation of preventive/mitigative measures for control pollution exposure should be adequate to prevent any public health impacts of this project.
- Project road will be designed in such a manner that there is no traffic congestion in the populated area along the project road
- Road will be designed in such a manner that there is no bottlenecks.
- All slopes and embankments will be turfed to minimize dust generation.
- Plantation of pollutants adsorbing fast growing trees species along the project road.

4.3 NOISE ENVIRONMENT

Noise impacts are perceived in both construction and operation stages of the project. Noise generated from the construction activities will be of high intensity and the construction workers and the residents in settlements around the construction sites will be adversely impacted due to continuous exposure to high noise levels due to the constructions activities. Due to the various construction activities, there will be temporary noise impacts in the immediate vicinity of the project corridor. The construction activity will include the excavation for foundation and grading of the site and construction of structures and facilities. Noise levels exceeding the norms at all places, especially around the settlement stretches along the corridor have to be attenuated at least to the daytime noise criteria for residential areas.

4.3.1 Nature of Impacts and Source Characteristics

From an acoustical point of view, environmental noise particularly highway traffic noise is a complex phenomenon because its intensity and characteristics varies with time depending upon the frequency as well as type of vehicle that passes on the road.

- A large number of vehicles on road will make the exposure situation of the road side receptors one of almost continuous nature of noise exposure, fluctuating between the high levels generated by typical noisy vehicles such as trucks/ buses and the lower noise generated by cars. A few events with a high noise levels will have the same Leq (see footnote) as a large number of exposure events but at a lower noise levels. But from biological point of view, it is unlikely that these two noise scenario's sharing same Leq but different exposure character will cause an equal effects on the exposed pollution.
- So main problems in road side traffic noise exposure is the question of to what extent is the number of different exposure events related to the human perception of environmental stimulation. The health effects that we measure in the exposed population may be discrete physiological reactions particularly of certain complex human responses, such as sleep disturbance or an effect on work performance efficiency. For human responses, those appearing after a single but a rare high exposure as well as those accruing after repeated low noise exposures (Chronic exposure) need to be evaluated carefully. Noise emission characteristics the mean noise levels in major urban locations of India of four different categories are presented in the following table 4.4. This table shows that actual noise

emission from automobiles in Indian cities is higher than the CPCB standards (at manufacturing stage) in use.

Table 4.4: Mean Noise Emission Levels from Vehicles

Type	Mean Sound Pressure leve Emission (dBA)	CPCB*(Std) dBA
2 Wheeler (2 Stroke)	82 dBA	80
3 Wheeler (2 Stroke)	87 dBA	80
Motor Car (Taxi Private Car)	85 dBA	82
Heavy Vehicles (Trucks)	92 dBA	85

Auto noise emission on roads depend on many factors such as traffic density, the type and condition of the vehicles plying on the road, vehicle operational changes (acceleration/deceleration/gear changes) depending on the level of congestion and smoothness of road surface (IRC: 104-1988). As far as impact assessment of road development project such as this are concerned, the impacts of noise pollution generated are associated with all the three phases of the project; pre-construction phase, construction phase and operational phase.

a. Pre-construction Phase

The typical on site pre-construction phase activates include:

- Man and material movements, ROW clearing of obstructions, trees, and establishment of labour camps, on-site offices, stockyards, construction material plants and maintenance yards etc.
- Among all these activities perhaps ROW clearing involve use of heavy machine and equipment otherwise all other activities will prevail for a short duration and also shall be localized in nature; besides this they are not likely to generate high noise pollution. The impacts of even such noise generating activities can be mitigated by not placing such project site infrastructure near to any residential or commercial activities or even labour colonies. Whereas, the other activities during this phase will prevail only for a short duration during the pre-construction phase and therefore are not likely to be of significance.

b. Construction Phase

The impacts on community noise exposure during construction stage will be quite significant and characteristics of exposure to different receptors shall be varying widely. However, all such impacts shall again be of temporary in nature, as the construction site will go on changing with the progress of the road development along different road stretches. The construction phase activities at during this phase can be broadly divided into two categories;

- one type include the excavation for foundation and grading of the site (including large scale material transportation and its handling using heavy vehicles), and
- Second is construction of structure and facility along with road development. Besides such construction site-specific activities, the other types of construction phase activities which emit noise include stone crushing, asphalt production plant and batching plants, etc.
- The activities of such plant operations shall relatively prevail for longer than other on-site activities and shall produce significantly high noise levels.

Mitigation Measures

- Areas near schools, hospital, several approaches to reduce noise will be employed by the contractor to ensure compliance with noise standards.
- These approaches includes the timing of noisy construction activities during night time and weekends when there are no activities by the sensitive receptors, concurrent noisy operations may be separated to reduce the total noise generated, and if possible reroute traffic during construction to avoid the accumulation of noise beyond standards.
- Bottleneck stretches to be bypassed and realignment for smooth flow of traffic, so that no traffic congestion occurs.

c. Operation Phase

Uninterrupted movement of heavy and light vehicles at high speeds will give rise to increase in ambient noise levels along the roadway. It may have negative environmental impacts on the sensitive receptors located within the zone of influence. In the period of operation of the proposed road the residential areas on either side of the highway road are likely to experience high day as well as night time noise levels. Noise propagation from a road is influenced by distance, ground surface meteorological conditions (wind and temperature), reflecting obstacles and increasing through barrier. The influence of the meteorological condition is mainly significant over long distance.

4.3.2 Prediction of Noise Impact on Noise level

A noise propagation modelling study has been conducted to find out the impact from the noise generated because of the estimated total traffic flow as well as the significance of these impacts. The noise modelling has been done taking into account the design speed at various stretches and the stretches with restricted speeds have been considered. DhwaniPRO is a computer program developed to undertake construction, industrial and traffic noise propagation studies for noise assessment. Different operative speeds have been used for various horizon years in the design life to get a realistic picture of the noise levels.

4.3.2.1 Outcome of the Noise level Modelling:

The outcome of the noise modelling is as follows:

- The predicted noise levels during both day and night time are below the stipulated limits at every stretches Upto the end of design life of the project for all the land uses i.e., commercial, residential/rural and sensitive.

Mitigation Measures

The following are the mitigation measures to reduce noise pollution:

- Noise standards will be strictly enforced for all vehicles, plants, equipment, and construction machinery. All construction equipment used for an 8-hour shift will conform to a standard of less than 90dB (A). If required, high noise producing generators such as concrete mixers, generators, graders, etc. must be provided with noise shields.
- Machinery and vehicles will be maintained regularly, with particular attention to silencers and mufflers, to keep construction noise levels to minimum.
- Workers in the vicinity of high noise levels will be provided earplugs, helmets and will be engaged in diversified activities to prevent prolonged exposure to noise levels of more than 90dB(A) per 8 hour shift.
- During construction vibratory compactors will be used sparingly within the urban areas. In case of complaints from roadside residents, the engineer will ask the site engineer to take suitable steps of restricting the work hours even further or use an alternative roller.
- Proposed tree and shrub plantations planned for avenue plantation especially close to settlements, may form an effective sound buffer during the operation stage.

4.4 WATER RESOURCES

Road development can lead to three types of modifications to the natural hydrological environment. These are:

4.4.1 Modification of the Surface Water Flow

The proposed project will no way alter the existing course of the surface water flow. However, the existing drainage problem will be mitigated in the proposed project. The construction of new bridges/ widening of existing bridges, crossing rivers, irrigation canals and culverts in the proposed design in the project will be aligned with the construction of highway. As such, the surface water flow in the rivers, streams and canals will be least affected. No local water supply will be used for construction purposes. Water will be taken from nearby surface water sources such as canals etc. that are available all along the project highway. Water sources have been identified along the project stretch in form of rivers and Canals, are listed in the below Table 4.5. Underground water will be taken after permission of concerned authority at construction sites if required. During the construction stage of the project, water sources shall test to check its suitability for construction purposes.

Table 4.5: Details of Water Resource

Sl. No	Chainage	Source
1	20+180	Ban Ganga River
2	63+508	Dhund River

4.4.2 Modification of the Groundwater Flow

The water level fluctuation varies from 20 and 40 m bgl. The overall composition of ground water indicates that it is moderately alkaline and predominantly CaHCO3 type (calcium bicarbonate).

Rainwater Harvesting

This is a green field alignment project. The proposed project will increase of surface run-off due to more paved road surface. It will have adverse impact on ground water recharging if measures are not taken during the design. Therefore, compensation is required to recharge ground water.

Impacts:

- Loss of ground water table due to withdrawal of ground water for construction.
- Increase of surface run-off due to more paved road surface.

Mitigation Measures:

- Detailed hydrological survey will be conducted and adequate drainage facilities provided to discharge the run-off to existing catchments area.
- Provision of rechargc pits, in thc design to recharge ground water, in thc urban area.
- Longitudinal roadside drains on both sides of the highway and out fall should be nearby culverts/ bridges on nalas/ rivers/ drains.
- All the construction preparatory activities for culverts, bridges and other structure will be carried out during dry seasons.
- Water for construction will be arranged by the contractor from the existing sources.
- Minimum use of water from existing sources for construction purpose will be ensured promoted at construction site/camps to minimizc likely impacts on other users.

Rainwater harvesting structures shall be provided near the disposal point of the side drains as prescribed by CGWB guidelines. The typical rainwater harvesting structure has been shown in Figure 4.1.

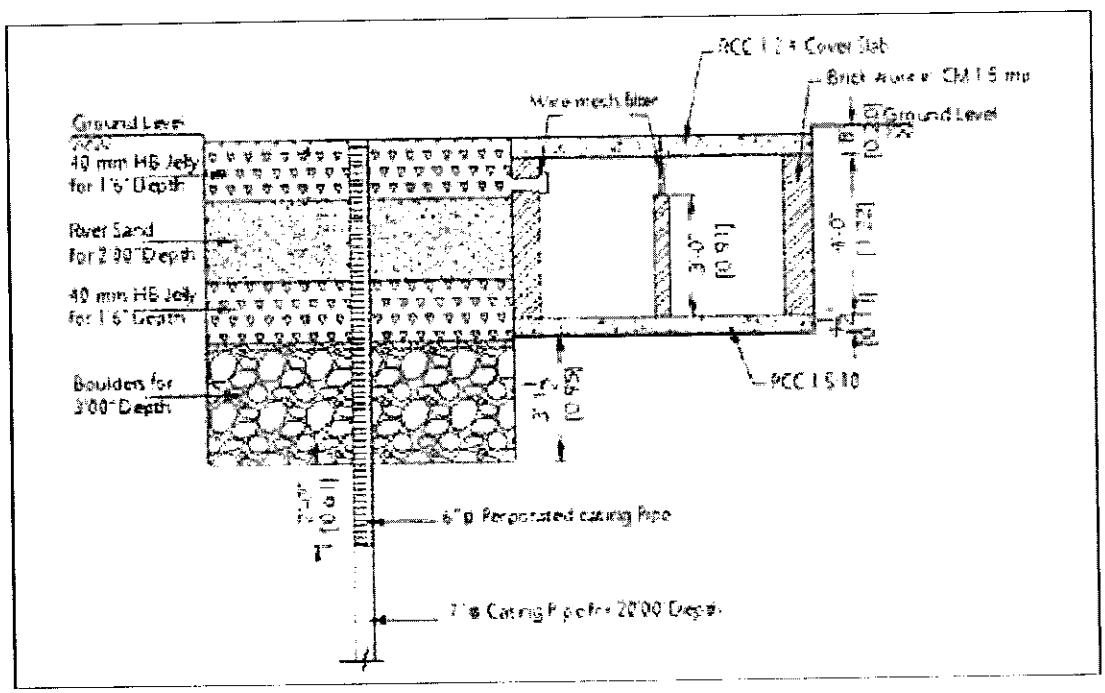

Figure 4.1: Rainwater harvesting structure

4.4.3 Water Quality Degradation

Some important parameters like pH, Chlorides, alkalinity etc. were compared with the acceptable standard for drinking water. No direct impact on water quality is predicted.

4.5 LAND ENVIRONMENT

4.5.1 Physiography

The impact of road construction on physiography is a function of the terrain of the area. Since entire length of bypass passes through plain areas and the main carriageway will be raised, therefore, there will be visible and significant impact on physiography of the region.

a. Preconstruction Stage

No significant impact on topography is envisaged during the pre-construction stage.

b. Construction Stage

The impacts on the local topography will be significant. Digging for the borrow materials would bring about significant changes in the existing topography around the borrow areas. Similarly stone quarrying, fill and cuts for widening, provision for construction, yard for material handling and building of project related structures can further alter the local topography of the project direct influence area.

c. Operation Stage

No significant impact is envisaged on topography during the operation stage.

4.5.2 Loss of Productive Soil

Loss of productive soil, although during the construction stage only, is envisaged at locations of workers camps, stockyards, storage godowns etc. if these are located on cultivated areas. Provision has been made in EMP to ensure that no productive areas are used for these purposes. In any case, though it would be a direct impact, it would be reversible and low in nature.

Land Use

The land use in all the bypass alignments will be converted into pavement permanently due to construction of the road. Thus fertile agriculture land coming within the RoW will be lost permanently. During the construction period, there will be temporary land acquisition for access road for construction site in the new alignment area, location of crushers, hot mix plants and workers camp for the project road.

Soil Erosion

Loss of productive soil due to road construction is direct, adverse and long term. It is therefore necessary to ensure that this top soil is replaced or rehabilitated for plantations or agriculture after construction. The loss of productive soil especially in irrigated areas can be considered a long-term residual impact. As the project involves the acquisition of some productive agricultural lands, the impact will be mitigated with the help of appropriate measures.

4.5.3 Contamination of Soil

a. Pre-construction Stage

The loss of topsoil and the contamination of the soil will be negligible in the pre-construction stage, as the site clearances activities do not involve stripping the site. However, the movements of heavy clearing machines will result in temporary compaction of the soil.

b. Construction Stage

During Construction Stage, the soil is likely to be impacted due to various construction activities. Spilling of Construction materials and the residual waste will result in soil pollution. The top soil is rich in nutrient value and supports rich bio-diversity. Location with this thin soil and soils already under erosion are susceptible to high impacts even with slight modifications in the area. Intense construction activities in these areas lead to erosion and loss of productivity. Impact will be more pronounced in this area due to lower permeability of the black cotton soil and hence higher retention time of the runoff from construction activities as well as the residential wastes.

Road construction activity will involve stripping all the top soil, however that is restricted within the direct influence zone i.e., RoW itself. Also the locations identified as borrow areas will experience the loss of productive soil cover. The EMP thereby ensures proper utilisation of this soil into landscaping activity and adequate trimming and dressing of the borrow areas. Spillage, leakage and disposal of construction materials, setting up of the construction camps and improper waste disposal will lead to short-term contamination of the soil.

c. Operation Stage

No loss of topsoil is envisaged during the operation stage of the road. However, the commuters along the road envisage contamination of the soil due to accidental leaks, spills and waste disposal during the operation stage. These impacts are reversible and short term.

Table 4.6: The Type and Scale of Soil Impact

Location	Type of Impact		Scale of Impact	Mitigation measures suggested
	Loss of productive soil	Erosion / Contamination		
Road side open stretches	No Loss; Beneficial	Very less	May be negative impact during construction	More trees plantation to enhance environment and for soil conservation.
Market and congested areas	No Loss; Beneficial	No	May be negative impact during construction	Not needed
Borrow pit area	No Loss of productive soil; Beneficial	No	-	Can be developed into pond for fisheries
Near Bridges	No significant Loss of productive soil	Soil erosion due to high embankment	-	By turfing, slope should be gradual

4.6 IMPACT ON FLORA, FAUNA AND ECOSYSTEM

4.6.1 Forest area

There is no reserved and protected forest has been envisaged for this project. Hence, Forest Clearance under the purview of Forest (Conservation) Act, 1980 is not applicable.

National Park/ Ecological Sensitive Areas

The 10-km buffer zone of the project area is not having any

- National Park
- Sanctuaries
- Biosphere Reserve
- Tiger/ Elephant Reserve

There is a scope of slight impact to local domestic animals, which graze in the area especially after the road is constructed. Increased vehicle movement in the area might lead to accidents involving animals. Apart from this, micro-ecosystems developed on the roadside with the birds, animals and insects using the plantation over the years would be lost due to loss of their habitat.

4.6.2 Removal of Trees

Approximately 4000 no. of trees recorded in Corridor of Impact. The impacts of tree cutting on the environmental quality will be as follows.

- The loss of trees will lead to higher degree of soil erosion. This has to be compensated by re-plantation of trees in the first priority, at the pre-construction stage.
- The loss of trees will reduce the ambient air quality since trees act as adsorbent of air pollutants thereby improving the air quality.
- The reduction in number of trees, especially in or near congested market places will enhance the raising of noise level.
- The other benefits of such trees such as shade, availability of fruits etc. will be worst affected till the new trees grow up and compensate.

However, a careful and proper planning of re-plantation of trees right at the commencement of construction and the phase wise removal of existing trees will mitigate the negative impacts.

Conservation and Mitigation Measures

Assessment of habitat quality, extent and analysis of usage and problems are essential prerequisite for Environmental Management Plan. Predicting barriers caused by local and state activities is critical. The following measures could be essentially practiced for the environmental and biodiversity conservation in the project area:

1. Management of Activities: A collaborative management approach involving the Forest department, Wildlife wing, Park personnel, local people and knowledge partners, such as, academia and research, and interface institutions like non-profit organizations and trusts would be appropriate for this purpose: for maintenance of wildlife habitat, habitat improvement and awareness generation. The establishment of industry must be discouraged in those areas nearby to Park and Eco sensitive zone.

2. Awareness Generation: It is, therefore, suggested that the information in regard to species of plants and animals existing in the project site, importance of these species for human beings

and conservation of food chain organisms and ecological processes essential for ecological balance at the site, threats for their survival and suitable package of practices for conservation of biodiversity need be made available to the local people and other stakeholders through print and electronic media, street plays (nukkar natak) and exhibitions. Local festivals and fairs (mela) can be better opportunities for awareness generation.

3. Promotion of Eco development and Ecotourism: In order to reduce the dependency of local people on the forest, savannah, grassland and natural biodiversity for different socio-economic needs, such as, fire-wood, small timber, leaf fodder and medicinal species, etc., the eco-development programme focusing on the cultural and socioeconomic and environmental dimensions specific to the project site need be encouraged utilizing local knowledge and practices. The existing Wildlife Sanctuaries (Nahargarh sanctuary, Jamwa Ramgarh wildlife sanctuary, Elefantastic Bird sanctuary) and development of the proposed highway will further promote tourism activities in the area, therefore, the local people centric-ecotourism focusing on savannah, grasslands, wetland and organic-agriculture (agro-tourism), and rural life-style (rural-tourism) need be strengthened and popularized in order to promote availability of natural resources indigenously, employment opportunities and income of the local inhabitants at their own location. Such an activity will also promote respect for local culture among the tourists and park visitors, besides supporting conservation through measures like zero-waste activities, organic farming, sustainable-harvest, green sanitation and green economy.

4. Control of Population Influx around the Highway: The construction of proposed Highway will lead to increase in human population from outside the project area also. This will adversely affect the carrying capacity of the project site (at least temporarily) as far as the space and livelihood needs are concerned. This needs to be regulated through development of well managed habitation and growth centres accordingly.

5. Promotion of Farm Forestry, Agro-Forestry and Silvo-Pasture: The multi-species land uses, such as, agro-forestry and farm forestry in the farm land, horti-pastoral and silvo-pastoral practices on the barren lands and wasteland need be given priority to achieve soil conservation and to obtain economic goods, such as, fire-wood, small timber, fodder and fruits simultaneously. For this purpose, locally-preferred species should be considered on priority.

6. Habitat Management for Wildlife: The landscape approach following decentralized collaborative management need be adapted for this purpose. The habitat management practices

such as, road-side plantation, rain water harvesting, fencing along road-side habitats specially near the Wildlife Sanctuary, eradication of invasive species regulated grazing by domesticated livestock at selected site (away from wild animal foraging and nesting grounds) and making roads less attractive to birds can be adopted. For good governance in the interest of wildlife conservation and sustainable economic development, the following regulatory measures need be practiced equitably in case of common citizens, authorities and very important persons:

- Wildlife (Protection) Act 1972 and amendments
- The Forest Conservation Act 1980
- The (Prevention and Control of Air Pollution) Act 1981
- The (Prevention and Control of Water Pollution) Act 1974
- The Environment (Protection) Act 1986
- The Biodiversity Act, 2002
- Discharge of effluents as per EPA, 1986
- Noise Pollution and Control Rules, 2000
- Construction and Demolition of Waste Management Rules, 2016
- Solid Waste Management Rules, 2016
- Plastic Waste Management Following Plastic Waste Management Rules, 2016.

7. Measures Taken For Pedestrian Safety

The Provision are 02 Major Bridge, 11 Minor Bridge, 10 VUP, 17 SVUP, 05 flyover, 01 ROB, 135 Box culverts and 1 cattle under pass has been provided in proposed project for safety of pedestrian and as well as animals.

4.6.3 Road Side Plantations

a. Pre-construction Stage

Impact on the roadside trees during the stage is significant as it involves site clearing. It will reduce the green cover of the region along with triggering a number of consequent impacts like.

- Reduced absorption of air pollutants and hence increase in pollutant concentration.
- Reduced attenuation of noise leading to increase in noise levels.
- Decreased soil holding capacity and increase in soil erosion.

b. Construction Stage

The Impacts envisaged during the construction stage are more or less the same as those in the pre-construction stage. More trees would be chopped down in order to provide the clear sight distance and meet the geometric requirement. The EMP will need to ensure the appropriate compensatory afforestation and landscaping along the corridor to mitigate the adverse impacts.

c. Operation Stage

No significant long-term impact is envisaged at this stage though some damage to the roadside trees is envisaged due to increased traffic and the resultant increase in vehicular emissions. The larger positive impact is envisaged with improvement in visuals and aesthetics due to the landscaping. The incidence of accidents would also reduce, as there would be adequate sight distance available.

4.7 SOCIAL ENVIRONMENT

4.7.1 Land Acquisition

a. Preconstruction Stage

As the proposed 6 laning is to acquire the additional land, the existing Row needs to be completely free of any squatters and encroachments. Most of the land acquired will be barren and agricultural land.

The preliminary baseline socio-economic survey identified that some structures are likely to be affected due to the project. The remaining included private and government structures that will be affected due to the proposed project. Most of the structures affected are of permanent nature.

The pre-construction stage demands the clearing of the site, which would result in disruption of the several community facilities. The facilities affected would be the following:

- Institutions
- Electric lines and poles
- Telephone Lines and Poles
- Hand pumps, wells, tube wells.
- Bus–stops

Community Facilities

The Community Facilities like public utilities and amenities get significantly disrupted during the construction activities. All community facilities and public utilities that are to be impacted

due to the project will be relocated prior to the commencement of the project construction.

A total of 80 structures are likely to be affected excluding the government and common properties resources. Most of the structures are likely to be affected belong to permanent category.

b. Construction Stage

The visual quality of the construction site and temporary detours may affect the local community. During the construction stage of the project, scattering of construction debris also presents an ugly look to the corridor. These effects will be minimized to the extent possible with pre-designated transit routes for the construction vehicles.

c. Operation Stage

Damage by vehicular collision if located nearer to the corridor. Overuse of the property-increased traffic will lead to commercialization of the abutting land, better communication along the corridor would also attract more visitors to these sites as rest areas, thus destroying their ambience.

4.7.2 Monuments/Historical areas & Archaeological sites

There is no important Archaeological resources, or sites of cultural interest within the study area that are of state or national level interest.

4.7.3 Human Health

a. Construction Stage

Human health is an issue of concern, especially in the construction camps. These camps if not adequately equipped for habitation will experience the outbreak of diseases. These camps are anticipated to house Upto 500 people for the period of 24-30 months. Given this concentration of people, the potential for disease and illness transmission will increase. However, the guidelines laid by the MOEF&CC, if appropriately, deployed, helps maintain the health standards.

Mitigation measures

Construction workers will be fully trained and will be provided adequate safety measures such as safety helmets, safety boots, earplugs and gloves. During construction regular training will be given to construction workers in respect of safety measures as well as environmental protection measures. Construction workers will also be provided ready access to on-or-off site health care

facilities to reduce the transmission of infectious diseases, and provide first aid for minor injuries.

4.7.4 Road Safety

Road Safety is an issue of concern at all the three stages. As mentioned above, the project road is prone to accidents. The activity related to construction and operation will increase the incidence of accidents. However, the situation will be improved during the operation stage due to the improved design.

a. Construction Stage

The construction activities and equipments during the construction stage will restrict the effective carriageway and block the traffic flow and become a potential cause for the increase in accidents. There might be cases of other accidents due to the construction activities, operation of hot mix plants etc.

b. Operation Stage

The Operation Stage envisages the design speed of 100 km/ hr along the urban section, there is pedestrian and cattle movement. These section become sensitive and are prone to accidents. However, due care has been taken during the design-stage to overcome such related hazards.

However, such incidents would be minimized with the help of appropriate mitigation measures. The chances of accidents could be minimized by (1) strengthening the pavements, (2) improving upon the curves in road geometrics, (3) fly-over and grade separators (4) proposing the service lanes in market places and near schools, etc (5) providing proper median, (6) improving upon road crossings (7) putting right signals and signboards, (8) new under passes. The human diseases caused by the contamination of water, increase in air pollutants and noise may go up by 5-10% but proper mitigation can take care of the situation.

4.8 SUMMARY OF ENVIRONMENTAL IMPACT ASSESSMENT

Table 4.7 presents the summary of Environmental Impact Assessment along with the mitigation Measures.

Table 4.7: Summary of Environmental Impact Assessment and its Mitigation Measures

Particulars	Stages	Potential Impacts	Mitigation Measures
Physiographic Environment			
Topography	Preconstruction	• Changes are	• Proper planning to keep the land

Particulars	Stages	Potential Impacts	Mitigation Measures
	& Construction	expected due to proposed project • Impacts are marginal, but permanent.	reformation up to bare minimum
Geology	Preconstruction & Construction	• Impacts are moderate because of extraction of sand	• If quarry opening is required then Prior Environmental Clearance shall be obtained from SEIAA / MoEF&CC (if applicable) and Quarry Development Plan will be enforced.
Climate			
Temperature / Rainfall / Humidity	Preconstruction & Construction	• Tree felling will have an impact of micro-climate of the area • Heat island effect due to increase in paved roads.	• Compensatory afforestation of the trees to be cut as per Forest Dept. guidelines. • With the proposed avenue plantation scheme, the micro climate of the project.
Land			
Loss of Forest	Design, Preconstruction & Construction	Diversion of forest	• Compensatory afforestation • Payment of NPV
Induced Development	Preconstruction & Construction	Change in the land use pattern	• Civil authorities to plan and guide any induced development using the prevailing regulatory framework.
Soil			
Soil Erosion	Preconstruction, Construction &	• In Road slopes and spoils	• Embankment protection through pitching & turfing

Particulars	Stages	Potential Impacts	Mitigation Measures
	Operation	• Erosion in excavated areas	• Regular water sprinkling in excavated areas
Contamination of Soil	Preconstruction, Construction & Operation	• Scarified bitumen wastes • Oil and diesel spills • Emulsion sprayer and laying of hot mix • Production of hot mix and rejected materials • Residential facilities for the labor and officers	• Hazardous and Other Wastes (Management & Trans-boundary Movement) Rules, 2016. • Oil Interceptor will be provided in storage areas for accidental spill of oil and diesel. • Rejected material to be laid as directed by monitoring consultant. • Septic tank to be constructed for waste disposal.
Water			
Impact on Water Resource	Design, Preconstruction, Construction & Operation	• Physical Impact / Partial loss of Water Bodies • Depletion of ground water recharge	• Wise design; compensatory digging. • Provision of Storage / harvesting structure of water, wherever feasible
		• Contamination of surface water system due to run-off from road construction area	• Oil Interceptor, sedimentation chambers, oils and grease separators and Septic tank in construction camp to be provided. • Enforcement of Hazardous and Other Wastes (Management & Trans-boundary Movement) Rules, 2016.

Particulars	Stages	Potential Impacts	Mitigation Measures
			• Both side drain facility to suitably divert the run-off from roads.
Air			
Dust generation	Preconstruction & Construction	• Shifting of utilities, removal of trees & vegetation, transportation of material	• Regular Sprinkling of Water • Fine materials to be completely covered, during transport and stocking. • Hot mix plant to be installed in down wind direction with at least 500m distance from nearby settlement. • Regular monitoring of particulate matter in Ambient Air
Gaseous pollutants	Preconstruction, Construction & Operation	• Operation of Hot mix plant and vehicle operation for material transportation.	• Air pollution Norms will be enforced. • Only PUC certified vehicles and machineries shall be deployed.
			• Laborers will be provided with mask. • Regular gaseous pollution monitoring in ambient air.
Ambient air quality	Operation	• Generation of Dust • Air pollution from traffic	• Paving of shoulders • Compliance with statuary regulatory requirements.
Noise			
Pre-Construction	Pre-Construction	• Man, material and machinery	• No Horn Zone sign, Speed Barriers near sensitive receptors

Particulars	Stages	Potential Impacts	Mitigation Measures
Activity		movements.	• Camps will be setup more than 500m away from settlements.
		• Establishment of labour camps, onsite offices, stock yards and construction plants.	
Construction Activity	Construction	• Operation of high noise equipment like hot mix plant, diesel generators etc. • Community residing near to the work zones.	• Camp will be setup more than 500m away from the settlements, in down wind direction. • Noise pollution regulation to be monitored and enforced. • Provision of Noise barriers etc.
Operation Stage	Operation	• Indiscriminate blowing of horn near sensitive area	• Restriction on use of horns • No Horn Zone sign.
Ecology			
Flora	Preconstruction, Construction	• Loss of vegetation cover. • Felling of trees.	• Felling of only unavoidable trees. • Compensatory Afforestation as per Forest Dept. guidelines. • Plantation of trees along the project road, median and in areas realigned and maintaining the same for a fixed period.
Fauna	Preconstruction Construction & Operation	• Loss of insect, avian and small mammalian species	• Compensatory Afforestation • Speed breaker and limit in sensitive areas

Particulars	Stages	Potential Impacts	Mitigation Measures
		due to felling of trees • Accidental run over	• Wise selection of alignment
Social			
Socio Environment	Design, Preconstruction & Construction	• Loss of livelihood • Loss of CPRs, Religious Structures.	• Rehabilitation Action Plan • Relocation of CPRs, Religious Structures to suitable place.
Public Health and Road Safety	Preconstruction, Construction & Operation	• Psychological impacts on project affected people. • Migration of worker may lead to sanitation problem creating congenial condition for disease vectors. • Discomfort arising of air and noise pollution. • Hazards of accident.	• Ensuring sanitary measures at construction camp to prevent water borne disease and vector borne disease. • Provision for appropriate personal protective equipment like earplugs, gloves gumboot, and mask to the work force. • Safe traffic management at construction area. • Drive slow sign and speed barriers near community facilities like school, hospital, etc.

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CHAPTER 5: ANALYSIS OF ALTERNATIVES

5.1 INTRODUCTION

This chapter tries to compare feasible alternatives to the proposed project with respect to site, technology, design etc. The alternatives examined take into account all possible and feasible options and include with and without project scenarios in terms of the potential environmental impacts for the justification of the project.

5.2 CRITERIA FOR SELECTION OF SITE

- The Economic Corridor between two terminal stations should be short and straight as far as possible, but due to engineering, social and environmental considerations, some deviations may be required.
- The project should be constructible and easy to maintain; the Greenfield project should reduce the vehicle operation cost with respect to the existing option already available i.e. using the NH/SHs in combination to reach from point A to point B.
- It should be safe at all stages i.e. during design, construction and operation stages.
- Safety audits at each stage should confirm the same.
- The project initial cost, maintenance cost, and operating cost should be optimum to be considered economical with respect to its options.
- The alignment should be finalized giving due consideration to siting/location of major structures including Major/Minor Bridges, Interchanges and ROBs. The space requirement of interchanges to be kept into consideration to avoid major resettlement.
- Tunnel / Box cutting of Hills should be considered as the last option and should be provided only when it is necessary.
- The location of spurs for connecting the important towns to be decided while fixing the alignment Options.
- The alignment should follow the unused / barren land to the extent possible to reduce the cost of land acquisition.
- The proposed options in the present case connects the under developed regions of Haryana which would lead to the development of new growth centres along the proposed highway i.e. paving the way for economic development of the region.

Obligatory points through which alignment options should not pass are detailed below:

Habitations: Proposed alignment is fixed in such a way that traverses at a minimum distance of 150 m from built up areas and avoiding important buildings and structures. However, few isolated buildings falling along the alignment cannot be avoided due to Geometric requirements.

Wildlife Sanctuaries, National Parks, Reserve Forest and other Eco Sensitive Zones: The proposed alignment does not pass through any Wildlife Sanctuary, National Park and other Eco Sensitive Zones. Also it does not passes through Revenue and reserve forests. Utmost care is taken while fixing the alignment near forest areas. The MOEF&CC guidelines have been adhered to and the alignment has been fixed keeping it away from any eco-sensitive zone.

Water Bodies: The proposed alignment has been fixed taking due consideration & importance of retaining the existing water bodies as far as feasible.

Railway Crossings and Important Structures: The components, which increases the project cost, are the presence of the Major bridges, ROBs and other structures. In order to reduce the project cost number of structures and its length were given due consideration while finalizing the alignment.

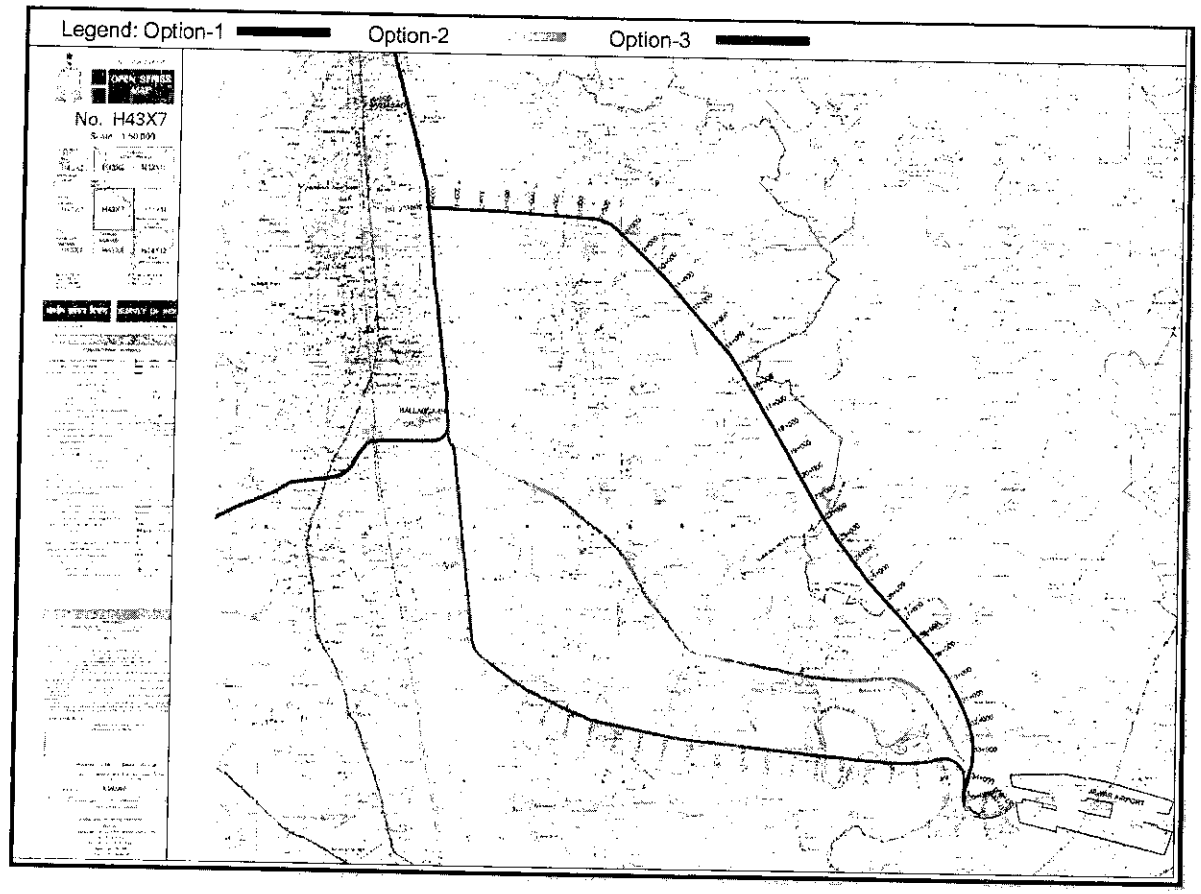

Figure 5.1: Toposheet map showing all the alignment option

Table 5.1: Comparative statements for all options are given in below table:

S. No.	Parameters/Issues	Option-I (Blue)	Option II- Greenfield Alignment (Green)- Proposed	Option III- (Magenta)
1	Length (km)	37.44	31.06	33.87
2.	Total land acquired (ha)	269.57	224.435	243.86
	Govt. land (ha)	20	20.435	21
	Pvt. Land (ha)	249.57	200	204.86
	Forest land (ha)*	2	4	18
3.	Area under protected/ important or sensitive species of flora or fauna/Wildlife Sanctuary	The alignment does not pass through any wild life sanctuary, protected area and its eco sensitive zone.	The alignment does not pass through any wild life sanctuary, protected area and its eco sensitive zone.	The alignment pass through Jamwa Ramgarh wild life sanctuary, protected area and its eco sensitive zone
4.	No. of trees	2500	3000	10000

5.	No. of structure to be impacted due to proposed alignment	Total=260 Permanent-104 Semi-Permanent=98 Temporary=58	Total=57 Permanent-12 Semi-Permanent=16 Temporary=29	Total=240 Permanent-113 Semi-Permanent=89 Temporary=38
6.	No. of families	312 Nos.	36 Nos.	339 Nos.
7.	No. of structure to be constructed	Major Bridges (03) Minor Bridges (02) Flyover (2) Interchanges (3) Viaduct (01) Vehicular underpass (10) LVUP (17) ROB (01) Box Culverts (74)	Major Bridges (01) Minor Bridges (01) Flyover (1) Viaduct (01) Vehicular underpass (05) LVUP (17) ROB (01) Box Culverts (57)	Major Bridges (01) Minor Bridges (04) Flyover (2) Interchanges/Flyover (3) Viaduct (01) Vehicular underpass (08) LVUP (12) ROB (01) Box Culverts (66)
8.	Connectivity	It Provides connectivity Between DME and EPE.	It Provides connectivity Between DME and EPE.	It Provides connectivity Between DME and EPE.
9.	Project cost (cr.)	2418	1906	2490

Table 5.1: Analysis of Alternatives

Sr.	Factors	Without Project Impacts	With Project Impacts

No.		Positive	Negative	No bypasses/re-alignment		Only small Re-alignment at critical sections		With Bypasses	
				Positive	Negative	Positive	Negative	Positive	Negative
1.	All weather Accessibility	-	Due to improper drainage system, road may get flooded during heavy rains.	-	Due to improper drainage system, road may get flooded during heavy rains.	Drainage in some sections will be improved	Only some sections may get good drainage	Road will be accessible all along the year since drainage will be improved along all sections.	-
2.	Road Safety/Accident rate	-	Due to congestion accidents may increase	-	Due to congestion accidents may increase at heavily populated areas and at	With realignment in critical sections, road safety would increase in these sections.	In densely populated/congested areas, accidents may increase	Heavily congested areas will be bypassed so less chances of traffic jam/accidents	-

					critical road sections			at these sections.	
3.	Transportation/vehicle maintenance /operating cost	-	Increased cost due to heavy traffic at populated/congested areas. And also more wear & tear because of frequent application of sudden brakes.		Increased cost due to heavy traffic at populated/congested areas And also more wear & tear because of frequent application of sudden brakes.	More comfortable driving at critical sections due to section improvement/realignment.	Increased costs due to more wear & tear at heavily populated/congested areas.	Less wear & tear cost, more riding comfort	Increase in air pollution due to vehicular and short term increase in dust due to earth work during construction at micro level.
4.	Travel time / increased speed	-	Travel time is more due to less speed & congestion.	-	Travel time is more due to less speed & congestion.	-	No significant change in travel time or speed	Reduction in travel time and increased speed.	More chances of accidents due to increased

									speed
5	Change in Land use pattern	-	-	-	Minor change in land use pattern	-	Small change in land use pattern.	-	Change in Land use pattern with land diversion from forest to road.
6.	Loss of Property and livelihood	-	-	-	More loss of property & livelihood.	-	Very little loss of property and mino loss of livelihood.	-	Minor Loss of property & significant loss of livelihood due to traffic diversion on bypass
7.	Change in Environment	-	-	-	-	-	-	-	Temporary degradation

	al quality during construction								of environmental quality because of vehicular traffic during construction.
8.	Change in Environmental quality after construction	-	Project road will further deteriorate and more dust and noise pollution	_	_	_	No significant change	Less Noise pollution because of ease in congestion and diversion of traffic through bypasses	Increase in Air pollution due to increased vehicular traffic.
9	Loss of vegetative			Greater loss of	-	-	Small amount of vegetative cover		Loss vegetative

	cover			vegetative cover than other options			loss		cover along the road side will be less. But significant loss of Agricultural land due to bypass.
10.	Access to basic facilities such as Markets, schools, Hospitals etc.	-	Difficulty in accessing the basic facilities due to heavy traffic.	Difficulty in accessing the basic facilities due to heavy traffic.	-	-	Difficulty in accessing the facilities	Easily accessible as the traffic will be less.	-
11.	Employment	-	Limited	Limited	-	Minor increase	-	Faster	-

	opportunities & local economy growth.		business opportunities. Overall development of area will be affected.	business opportunities.		in business opportunities		transportation of agricultural/ commercial/perishable goods to prospectus markets. And local employment generation.	
12.	Others	-	Increase in fuel consumption, dust pollution & vehicular emission. And overall economy of the	-	-	Minor savings on fuel consumption	-	Tourism will flourish (Access to Wadi improved), Improved riding quality	Loss of business opportunity in the congested populated area.

			state will be affected.					& smooth traffic flow. Will reduce accidents in congested areas.	

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CHAPTER 6: ENVIRONMENTAL MONITORING PROGRAMME

6.1 ENVIRONMENT MONITORING PROGRAMME

The Environmental Monitoring Programme provides such information on which management decisions may be taken during construction and operational phase. It provides basis for evaluating the efficiency of mitigation and enhancement measures, and suggested actions that need to be taken to achieve the desired effect. The monitoring includes:

i. Visual observation
ii. Selection of environmental parameters at specific locations, and
iii. Sampling and regular testing of these parameters.

The objectives are:

- Evaluation of the efficiency of mitigation and enhancement measures
- Updating of the actions and impacts of baseline data
- Adoption of additional mitigation measures if the present measures are insufficient
- Generating the data which may be incorporated in the environmental management plan in future projects.

6.1.1 Ambient Air Quality (AAQ) Monitoring

The air quality is recommended for monitoring through an approved agency in the process of Construction of new Six Lane National Highway from The proposed alignment starting from starts from Junction with Ballabhgarh Bypass near village Chandawali (District-Faridabad, Haryana) and terminating at Jewar International Airport near Ballabh Nagar Urf Karol Bangar village (District- Gautam Buddh Nagar, Uttar Pradesh) The monitoring of air sampling should be conducted at the location of Crusher plant, HMP, Stockyards Batching plant, Haul roads. In addition to these, air quality should also be monitored near the storage sites having aggregates, sands etc.

- Particulate Matter, PM10, PM2.5
- Sulphur Dioxide
- Oxides of Nitrogen, and
- Carbon Monoxide

6.1.2 Water Quality

Water quality and public health parameters should be monitored till the end of project and two years after the completion. Monitoring should be carried-out at quarterly basis, to cover seasonal variations, by any recognized agency. Water quality shall be analysed by applying the standard tcchnique. The parameters for monitoring arc given below.

6.1.3 Ambient Noise Monitoring

The monitoring of noise sampling should be conducted at thc location of plant sites i.e. crushcr plant, HMP and construction sites etc. In addition to these, noisc quality should also be monitored near thc school, hospital, other sensitive sites and residential areas exist along the 40 meter to 50 meter distance of project road or at the designated locations fixed –up by the environmental expert.

The procedural details of monitoring of various components have been presented in Table 6.1.

Table 6.1: Environmental Monitoring Plan

Environmental Components	Monitoring			Location	Frequency	Institutional Responsibility	
	Parameters	Special Guidance	Standards			Implementation	Supervision
Air Quality	PM2.5, PM10, SO2, NOX, CO	As per CPCB guidelines	The Air (Prevention and Control of Pollution) Rules, CPCB, 1982	At sites where hot mix plant /batching plant is located	Twice in a month till the end of the construction	Contractor through approved monitoring agency	IC, NHAI-PIU
Ground and Surface Water Quality	pH, temperature, BOD, Total Hardness, COD, TDS, TSS, DO, Total coliform, Conductivity, Oil & Grease	Grab priority collected from source and analyze as per standard methods for examination of water	Water quality standards by CPCB	River tributaries, roadside ponds and ground water at construction camp sites	Once in a season till end of construction	Contractor through approved monitoring agency	IC, NHAI-PIU

		and wastewater					
Noise Levels	Noise level for day and night on dB(A)scale	In free field at 1m distance from the equipment to be monitored	Noise standard by CPCB	At equipment yards, camp and villages along the alignment.	Once in a season till end of construction	Contractor through approved Monitoring agency	IC, NHAI-PIU
Soil quality	Monitoring of NPK &heavy metals and grease		As per IRC code of practice	Ad-hoc if accident /spill locations involving bulk transport of carrying hazardous material		PIU through an approved agency	IC, NHAI-PIU
Road side plantation	Monitoring of felling of trees Survival rate of trees, success of re- vegetation	It should be ensured that only marked trees are felled. The number of	As given in the Detailed Design for the project. The survival rate should be atleast	All along the corridor At locations of compensatory afforestation	During the felling of trees Every year for 3	Forest depart Competent Agency PIU	Developer to assist in coordination with NHAI

		trees surviving during each visit should be compared with the number of saplings planted	75% below which replantation should be done		Years		Developer & Forest Department

6.2 ENVIRONMENTAL MONITORING COST

The environmental monitoring cost is estimated on the basis of the length and existing environmental scenario of the proposed project. Environmental monitoring cost of 1080000/- has been allocated for construction and 3,60,000/- per year for operation stages. The details have been presented in Table 6.2.

Table 6.2: Environment Monitoring Cost

S.No.	Parameters/Components	Particular	Guidelines	Total Cost (Rs)
1	Ambient Air Monitoring: At construction Stage: At 5 locations for three season in a year for 3 years (twice a week)	Monitoring at Construction Sites	PM2.5 and Respirable dust samplers to be used and located 50 m from the construction site	2.1
	At Operation Stage: At 5 locations for three season for a year (twice a week)	Ambient Air Quality Monitoring	-	0.7
2	Ground Water Monitoring: At Construction Stage: At 4 locations for three season in a year for 3 years	Ground water Bodies	Analyze as per the standard methods for examination of water and waste water	2.7
	At Operation Stage: At 5 locations for three season for a year	Ground water Bodies	Analyze as per the standard methods for examination of water and waste water	0.9
3.	Surface Water	Surface water	Analyze as per the	1.5

	Monitoring: At Construction Stage: At 3 locations for three season in a year for 3 years	Resources	standard methods for examination of water and waste water	
	At Operation Stage: At 3 locations for three season for a year	Surface water Resources	Analyse as per the standard methods for examination of water and waste water	0.5
4.	Noise Monitoring: At Construction Stage: At 5 locations for three season in a year for 3 years	At equipment yards/ construction sites identified by IC	Using an integrated noise level meter kept at a distance of 15 m from the construction site	2.1
	At Operation stage At 5 locations for three season for a year	As directed by the Engineer	-	0.7
5.	Soil Monitoring: At Construction Stage: At 4 locations for three season in a year for 3 years	At productive agricultural land	-	2.4
	At Operation Stage: At 4 locations where for three season for a year	At productive agricultural land	-	0.8
	Total Monitoring Cost (A)			14.4

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CHAPTER 7-ADDITIONAL STUDIES

7.1 PUBLIC CONSULTATION/HEARING

Public hearing is yet to be conducted and the detail will be provide in Final EIA report

7.2 RISK ASSESSMENT

Risk assessment is fundamentally a management activity supported by persons familiar with risk management activities. A comprehensive risk assessment combines both qualitative and quantitative assessments. The qualitative assessment is useful for screening and prioritizing risks and for developing appropriate risk mitigation and allocation strategies. The quantitative assessment is best for estimating the numerical and statistical nature of the project's risk exposure

Construction of highways involves various risk factors from designing and planning stages to completion of project. Therefore, risk assessment consisting of risk identification, risk classification and risk analysis or evaluation is necessary for maintaining cost and quality of the project and for scheduled completion of the project.

RISK CONTROL MEASURES

General precautions to be maintained by the Contractor:

a. Maintenance of safe systems and without risks to health
b. Safe use, handling, storage and transportation
c. Information, instruction, training and supervision for health and safety
d. Maintenance of means of safe access and egress
e. Safe working environment
f. Provision of Safe articles for use and without risks to workers
g. Necessary tests and examination for the use of articles before works
h. Adequate information for the use of articles in factory
i. Elimination/minimization of risks to health and safety wherever necessary
j. Application of suitable methods for prevention and accumulation of dust and fumes
k. Exhaust system for extracting toxic fumes and dust
l. Fencing system for every dangerous and moving part; all moving parts shall be enclosed
m. Striking gear and devices for cutting off power in an emergency.

7.3 HAZARD IDENTIFICATION RISK ASSESSMENT

Hazard Identification Risk Assessment is a process of defining and describing hazards by characterizing their probability, frequency, and severity and evaluating adverse consequences, including potential losses and injuries.

Emergency Response Plan

The overall objective of an ERP is to make use of the combined resources on-site and outside services to achieve the following:

- To localize the emergency and, if possible, eliminate it
- To minimize the effects of the accident on the people and property on-site
- Effect the rescue and medical treatment of causalities.
- Safeguard other people
- Evacuate people to safe areas/assembly points
- Informing and collaborating with statutory authorities to tackle the emergency
- Initially contain and ultimately bring the incident under control
- Preserve relevant records and equipment for subsequent enquiry into the cause and circumstances of the emergency, and
- Investing and taking steps to prevent recurrence.

7.3.1 Hazards due to External Traffic

Hazards occur due to external traffic are as follows:

- External vehicle with other stationery objects in the side of the road.
- Due to fall in excavated trenches, Construction workers hit by external vehicles while working, Collision between external vehicle and construction equipment /vehicle.
- Collision due to improper traffic management.
- Hit by construction equipment / vehicle.
- Use of carriageway due to blockage / absence of footpath, Injury to Pedestrians.

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CHAPTER 8: PROJECT BENEFITS

INTRODUCTION

8.1 INTRODUCTION

The proposed highway starts from Junction with Ballabhgarh Bypass near village Chandawali CH: 0+000 (District-Faridabad, Haryana) and terminating at Jewar International Airport near Ballabh Nagar Urf Karol Bangar village CH: 31+060 (District- Gautam Buddh Nagar, Uttar Pradesh) passing through districts Faridabad, Palwal & Gautam Buddh Nagar in the state of Haryana & Uttar-Pradesh.

Scope of present report is confined to the (Ch. 0+000 to Ch. 31+060).

The Proposed ROW of this section is taken as 60m in which all the configurations shall be fitted with. This is a green field alignment, and is proposed for 6-Lane. The proposed length of Project Highway is about 31.060 kms.

The road passes through the districts of Faridabad, Palwal & Gautam Buddh Nagar through important villages/towns like Ballabhgarh, Mohna, Palwal, Jewar in the state of Haryana & Uttar-Pradesh.

Existing carriage away and pavement detail

This is a completely new proposed Green Field Alignment where there is no existing road. This road is proposed to divert the long route traffic, The whole section is proposed to be of Flexible Pavement type confirming to IRC: 37:2018. Rigid pavement shall be constructed in the section(s) for Toll Plaza only. The configuration of the carriageway shall confirm to IRC: SP: 84:2019 and the Structures shall be constructed as 6 lane configurations.

The Project will further have following benefits at national and regional level:

- High-speed connectivity and access: The projected corridor is a proposed economic corridor. This will avoid traffic congestion and speed-up the freight movement.
- Aiding economic growth: The seamless connectivity will provide better access to vehicles.
- The Project will reduce travel time and provide boost to trade and commerce linked to the regions connected through this economic corridor.
- Growth of backward areas: The biggest strength of the alignment is that it plans to cover backward districts of Haryana. As a result of connectivity and access to other parts of the country, these backward areas will be aided to integrate with rest of the

world. Further, freight and passenger traffic on the economic corridor will help promoting ancillary economy of these regions.

- Decongestion of existing Highways: The proposed corridor will take away traffic pressures from existing highways passing through various cities. In addition, long-distance traffic will shift to the proposed corridor, thereby leaving the existing NH and SH for regional and local usage.
- Usage shift: Long-distance traffic will shift from existing roads to the proposed Economic Corridor, resulting in lesser congestion on these highways.
- Improved safety: Due to access control, the Roadway & Travel Safety of the traffic connecting the cities will be enhanced, as there will be minimum distractions & conflict zones.
- Support to industry: Different types of industries like Manufacturing, Tourism etc. along the proposed corridor will be facilitated in their business operation and reach ability.

8.2 ENVIRONMENTAL BENEFITS FROM THE PROJECT

The environmental benefits from the proposed project have been described below:

- Better level of service in terms of improved riding quality and smooth traffic flow.
- Faster transportation will ultimately lead to massive savings in the form of reduced wear and tear of vehicles, reduced vehicle operating costs (VOCs) and total reduction in transportation costs etc.
- With the improvement of road surface, the traffic congestion due to obstructed movement of vehicles will be minimized and thus wastage of fuel emissions from the vehicles will be reduced.
- Increased road landscaping and safety features.
- Plantation of tree all along the proposed highway will improve the tree density along the RoW, which will improve aesthetics as well as trees will act as a pollution absorber.
- The compensatory plantation and roadside plantation shall further improve the air quality of the region.
- Overall Environment improvement of the region.

8.3 SOCIO-ECONOMIC BENEFIT OF THE PROJECT

- The proposed project shall generate an employment opportunity to about 1000 persons during construction phase for a period of approx. 2 years. However, during operation phase due to construction of toll plazas approx. 100 persons will be employed on permanent basis. Preference will be given to local people for employment. It shall also generate additional employment opportunities in form of transportation of construction materials, greenbelt development and implementation of EMP.
- During operations phase, the Project will largely have indirect employment benefits in form of highway amenities and through economic & social hubs developed around the Economic Corridor.
- Efficient reach and connectivity to distant markets will further enhance economy of the districts and create employment opportunities.
- Enhanced connectivity between rural & urban population, which will benefit the all sections of the society like general population, small-medium-large scale industries, farmers, businessmen etc.
- Faster transportation will strengthen tourist development in the area.
- Improved access to higher education facilities & modern health facilities.
- The project will enhance economic development in the area through industrial areas
- The project also connects major other city like Faridabad, Palwal & Gautam Budh Nagar in Haryana & Uttar-Pradesh state.

8.4 ROAD SAFETY

Indian Road Congress (IRC) codes will be followed in proposing and designing road safety features. Pavement markings will be done for traffic lane line, edge lines and hatching. The marking will be with hot applied thermoplastics materials. The pavement markings will be reinforced with raised RR pavement markers and will be provided for median and shoulder edge longitudinal lines and hatch markings. Highway lightings including high masts will be provided at intersections in order to improve the night time visibility. All the urban locations as well grade separated structure locations will be provided lighting arrangements.

The construction of green alignment of New Six Lane national Highway from Junction with Ballabhgarh Bypass near village Chandawali (District-Faridabad, Haryana) and terminating at

Jewar International Airport near Ballabh Nagar Urf Karol Bangar village (District- Gautam Buddh Nagar, Uttar Pradesh).

8.5 REDUCTION IN VEHICLE OPERATING COST

Vehicle Operating Cost (VOC) will be reduced when the highway is constructed. Fuel consumption, wear and tear of tyres, suspension will be benefited when a geometric of the road is improved. VOC consist of the following components.

- Fuel consumption
- Lubricating oil consumption
- Spare part consumption
- Tyre consumption
- Vehicle depreciation

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CHAPTER 9: ENVIRONMENTAL MANAGEMENT PLAN

9.1 INTRODUCTION

The Environmental management Plan (EMP) consists of set of mitigation, monitoring and institutional measures to be taken during the design, construction and operation stages of the project to eliminate adverse environmental impacts, to offset them, or to reduce them to acceptable levels. The plan also includes the action needed for the implementation of these measures. The summary of all activities are provided in Table 9.1.

The major components of the Environmental Management plan are:

- Mitigation of potentially adverse impacts;
- Monitoring during project implementation and operation;
- Institutional capacity building and training;
- Implementation schedule and Environmental cost estimates; and
- Integration of EMP with Project planning, design, construction and operation.

9.2 OBJECTIVES OF THE EMP

The main aim of the Environmental Management Plan is to ensure that the various adverse impacts are mitigated and the positive impacts are enhanced. The objectives of the EMP at various stages of the project planning and implementation are as follows:

Design Stage

- To have minimum impact on road side tree, forestation and ground cover;
- To keep land acquisition and building demolition at a minimum;
- To provide maximum safety to the road users and road side communities;
- To develop a design that incorporates environmental safeguards; and
- To provide mitigation measures to all expected environmental degradation due to the project activity.

Constructions Stage

- To prevent and reduce the adverse environmental impacts of the project by implementing mitigation measures; and
- To ensure that the provisions of the EMP are strictly followed and implemented by strengthening implementation arrangements.

Operation Stage

- To prevent deterioration of environment components of air, water, soil, noise etc.
- To improve the safety of the road users and road side communities.

Table 9.1: Environmental Management Plan for NH

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
PRE CONSTRUCTION AND CONSTRUCTION STAGE				
Land Acquisition, R&R (Throughout the Project Corridor)	The acquisition of land and private properties will be carried out in accordance with the RAP and entitlement Framework for the project. It will be ensured that all R&R activities are to be completed before the construction activity starts, on any section of project area.	District Magistrate	Project Execution Agency	NHAI
Clearance of Encroachment/ Squatters	Advance notice, as per RAP shall be given to the encroachers and squatters which need relocation. All R & R activities will be undertaken. Entitlements as per state govt's entitlement framework for this project will be completed before construction starts.	Revenue Authorities	Project Execution Agency	NHAI
Tree Cutting (Throughout the Project Corridor)	3000 no of trees have been identified to be removed. If necessary, the trees will be cut as per guidelines of MoEF&CC and forest dept.	Forest Dept.	Project Execution Agency	National Highway Division

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
Relocation of Community utilities (Throughout the Project Area)	All such Community utilities, if required will be relocated as per Govt of Haryana rules.	District administration	Project Execution Agency	National Highway Division
Relocation of Cultural Property Resources (Throughout the Project Area)	No relocation suggested in the planning stage.	District administration	Project Execution Agency	National Highway Division
Crushers, Hot-mix Plants & Batching Plants	Specifications of crushers, hot mix plants and batching plants will comply with the requirements of the relevant current emission control legislations.	State PCB, Haryana & Uttar-Pradesh	Contractor	National Highway Division
Other Construction Vehicles, Equipment and Machinery	All vehicles, equipment and machinery to be procured for construction will confirm to the relevant Bureau of India Standard (BIS) norms. The discharge standards promulgated under the Environment Protection Act, 1986 will be strictly adhered to. Noise limits for construction equipments to be procured such as compactors, rollers, front	RTO and State PCB, Haryana	Contractor	National Highway Division

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	loaders concrete mixers, cranes (moveable), vibrators and saws will not exceed 75 dB (A), measured at one meter from the edge of the equipment in free field, as specified in the Environment (Protection) Rules, 1986.			
Identification and Selection of Material Sources				
Construction Materials	The Contractor will not start borrowing earth from any borrow area until the formal agreement is signed between landowner and Contractor.	State Mining Department and State Pollution Control Board.	Contractor	National Highway Division
Stone chips	The Contractor will obtain necessary permission for procurement of materials from State Mining Department and State Pollution Control Board. Contractor will also work out haul road network and report to Environmental Expert who will inspect and in turn report to National Highway Division, before approval.	State Mining Department and State Pollution Control Board.	Contractor	National Highway Division
Arrangement for Construction Water	The Contractor will source the requirement of water essentially from water supplied by Municipal bodies and	CGWB, Contractor, and	Contractor	Environmental Expert of

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	cannot use the ponds, which are in use by community. The Contractor will not be allowed to pump from the surface water bodies used by community. In that case, before using any pond water Contractor will inform the owner. To avoid disruption / disturbance to other water users, the Contractor will extract water from fixed locations and consult the Environmental Expert before finalizing the locations. The Contractor will need to comply with the requirements of the state Ground Water Department and seek their approval for doing so, if inevitable.	water supplying agency of the area.		National Highway Division,
Labour Requirements	The Contractor will use unskilled labour drawn from local communities to avoid any additional stress on the existing facilities (medical services, power, water supply, etc.)	-	Contractor	Environmental Expert and National Highway Division.
Construction Camp	Siting of the construction camps to be as per the guidelines	-	Contractor	Environmental

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
Locations- Selection, Design & Layout	presented below Construction camps will not be proposed within 1000 m from the nearest settlements to avoid conflicts and stress over the infrastructure facilities with the local community. The waste disposal and sewage system for the camp will be designed, built and operated such that no odour is generated.			Expert of National Highway Division, Haryana & Uttar-Pradesh .
	Unless otherwise arranged by the local sanitary authority, arrangements for disposal of night soils (human excreta) suitably approved by the local medical health or municipal authorities or as directed by Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh will need to be provided by the Contractor.			
Hot Mix Plants and Batching Plant	Hot mix plants and batching plants will be sited sufficiently away from settlements and agricultural operations or any	State PCB, Haryana &	Contractor	Environmental Expert of

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
Locations	commercial establishments. Such plants will be located at least 1000 m away from the nearest village scttlements preferably in the downwind direction.	Uttar-Pradesh		National Highway Division, Haryana & Uttar-Pradesh
Arrangements for Temporary Land Requirement	The Contractor as per prevalent rules will carry out negotiations with the landowners for obtaining their consent for temporary use of lands for construction sites/hot mix plants/traffic detours/ borrow areas etc. The Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh will be required to ensure that the clearing up of the site prior to handing over to the owner (after construction or completion of the activity) is included in the Concession Agreement.		Contractor	National Highway Division, Haryana & Uttar-Pradesh
Site Clearance				
Construction Wastes Disposal including Fly	The pre-identified dump locations will be a part of comprehensive solid waste management plan to be prepared		Contractor	Environmental Expert National

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
Ash	by the Contractor in consultation with Environmental Expert of National Highway Division.			Highway Division, Haryana & Uttar-Pradesh.
	Location of disposal sites will be finalized prior to completion of the work on any particular section of the project area. The Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh will approve these disposal sites. Contractor will ensure that any spoils of material unsuitable will not be disposed off near any watercourse, agricultural land, and natural habitat like grasslands or pastures. Such spoils from excavation can be used to reclaim borrow pits and quarries, low-lying area in barren lands along the project corridors. No fly ash will be disposed in any disposal site. Contractor will take care if any residual fly ash (if used) is remain after			

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	construction work either this will be returned to the source or used in construction. National Highway Division, Haryana will keep strict vigil on this aspect. All waste materials will be completely disposed and the site will be fully cleaned before handing over. The Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh will certify the site after approval. The Contractor at its cost shall resolve any claim, arising out of waste disposal.			
Stripping, Stocking and Preservation of Top Soils	The topsoil from all areas of cutting and all areas to be permanently covered will be stripped to a specified depth of 150 mm and stored in stockpiles. At least 10% of the temporarily acquired area will be earmarked for storing topsoil and following precautionary measures will be taken to preserve them till they are used: Stockpile will be designed such that the slope does not exceed 1:2 (vertical to horizontal), and height of the pile is restricted to 2 m.		Contractor	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh.

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	Stockpiles will not be surcharged or otherwise loaded and multiple handling will be kept to a minimum to ensure that no compaction will occur. The stockpiles shall be covered with gunny bags or tarpaulin sheets. It will be ensured by the Contractor that the topsoil will not be unnecessarily trafficked either before stripping or when in stockpiles. Such stockpiled topsoil will be utilized for covering all disturbed areas including borrow areas, top dressing of the project area embankments and fill slopes filling up of tree pits, in the median, and in the agricultural fields of farmers, acquired temporarily. The management of topsoil shall be reported regularly to the Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh .			
Accessibility	The Contractor will provide safe and convenient passage for vehicles, pedestrians and livestock to and from roadsides	RTO, Traffic dept.	Contractor	Environmental Expert of

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	and property accesses connecting the project area. The Contractor will also ensure that the existing accesses will not be undertaken without providing adequate provisions to the prior satisfaction of the Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh. The Contractor will take care that the cross project areas are constructed in such a sequence that construction work over the adjacent cross project areas are taken up one after one so that traffic movement in any given area not get affected much.			National Highway Division, Haryana & Uttar-Pradesh.
Raw Materials	The Contractor shall obtain materials only from the approved sources after consent of the department of Mining.	Department of Mining, Govt of Haryana & Uttar-Pradesh.	Contractor	Environmental Expert of National Highway Division, Haryana &

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
				Uttar-Pradesh.
Transporting Construction Materials and Haul Road Management	Contractor will maintain all project areas (existing or built for the project), which are used for transporting construction materials, equipment and machineries. All vehicles delivering materials to the site will be covered to avoid spillage of materials. All existing highways and roads used by vehicles of the Contractor, or any of his sub-Contractor or suppliers of materials and similarly roads, which of all dust/mud dropped by such Vehicles.		Contractor	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh .
	Contractor will arrange for regular water sprinkling at least thrice a day (i.e., morning, noon and evening) for dust suppression of such project areas particularly the earthen project areas. The unloading of materials at construction sites close to settlements will be restricted to daytime only.			
Water				
Construction Water	Contractor will arrange adequate supply and storage of	State Ground	Contractor	Environmental

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	water for the whole construction period at his own costs. Contractor will not open new bore well or extract groundwater without permission from the Haryana & Uttar-Pradesh Water Board.	Water Board.		Expert of National Highway Division, Haryana & Uttar-Pradesh .
	The Contractor will take all precaution to minimize the wastage of water in the construction process/ operation. Contractor will not take water from any irrigation canal or any other surface water bodies without written permission by the competent authority. If Contractor uses any existing source of water, (subject to the provision that any claim arising out of conflicts with other users of the said water body shall be dealt with entirely by the Contractor) (s) he will seek permission from the owner and Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh . National Highway			

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	Division will ensure that such activity will not deprive the original user of the concern water source (s). Environmental Expert of National Highway Division, Haryana will also keep a strict vigil on this aspect and it will be reflected in compliance report to MoEF&CC.			
Drainage and Flood Control	Contractor will ensure that no construction materials like earth, stone, ash or appendage disposed off so as not to block the flow of water of any water course, and cross drainage channels. Contractor will take all necessary measures to prevent the blockage of water flow. In addition to the design requirements, the Contractor will take all required measures as directed by the Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh to prevent temporary or permanent flooding of the site or any adjacent area.	District Administration	Contractor	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh .
Water Pollution from	The Contractor will take all precautionary measures to	Haryana &	Contractor	Environmental

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
Construction Wastewater	prevent the wastewater during construction from entering directly into streams, water bodies or the irrigation system. The Contractor will strictly follow the discharge standards promulgated under the Environmental Protection Act, 1986. All waste arising from the project is to be disposed off in the manner that is acceptable to the Haryana & Uttar-Pradesh State Pollution Control Board. Environmental Expert of National Highway Division, will certify that all liquid wastes disposed off from the sites meet the discharge standards.	Uttar-Pradesh, State PCB		Expert of National Highway Division, Haryana & Uttar-Pradesh
Siltation of Water Bodies and Degradation of Water Quality	The Contractor will not excavate beds of any stream/ canals/ any other water body. Contractor will construct silt fencing at the base of the embankment construction for the entire perimeter of any water body (including wells) adjacent to the RoW and around the stockpiles at the construction sites close to water bodies. The fencing will be provided prior to	Dept of Irrigation, Govt of Haryana.	Environmental Expert of National Highway Division, Haryana.	National Highway Division, Haryana

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	commencement of earthworks and continue till the stabilization of the embankment slopes, on the particular sub-section of the road. The Contractor will also put up sedimentation cum grease traps at the outer mouth of the drains located in truck lay bays and bus bays which are ultimately entering into any surface water bodies / water channels with a fall exceeding 1.5 m. Contractor will ensure that construction materials containing fine particles stored in an enclosure such that sediment-laden water does not drain into nearby watercourse.			
Slope Protection and Control of Soil Erosion	The Concessionaire will take slope protection measures as per design, or as directed by the Environmental Expert to control soil erosion, sedimentation through use of dykes, sedimentation chambers, basins, fibber mats, mulches, grasses, slope, drains and other devices. All temporary	Dept of Irrigation, Govt of Haryana & Uttar-Pradesh.	Contractor	National Highway Division, Haryana & Uttar-Pradesh.

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	sedimentation, pollution control works and maintenance thereof will be deemed as incidental to the earth work or other items of work.			
	Separate payment will be made for them. Concessionaire will ensure the following aspects: During construction activities on road embankment, the side slopes of all cut and fill areas will be graded and covered with stone pitching, grass and shrub as per design specifications. Turfing works will be taken up as soon as possible provided the season is favourable for the establishment of grass sods. Other measures of slope stabilization will include mulching netting and seeding of batters and drains immediately on completion of earthworks. In borrow pits, the depth of the pits shall be so regulated that the sides of the excavation will have a slope not steeper than 1 vertical to 2 horizontal, from the edge of the final			

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	section of the bank. Along sections abutting water bodies, stone pitching as per design specification will protect slopes.			
Water Pollution from Fuel and Lubricants	The Contractor will ensure that all construction vehicle parking location, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance and refuelling sites will be located at least 1000 m from rivers and irrigation canal/ponds or as directed by the Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh. Contractor will ensure that all vehicle/machinery and equipment operation, maintenance and refuelling will be carried out in such a fashion that spillage of fuels and lubricants will be minimised and does not contaminate the ground. Oil interceptor will be provided for vehicle parking,	Haryana & Uttar-Pradesh state PCB	Contractor	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh.

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	Contractor will arrange for collection, storing and disposal of oily wastes to the approved disposal sites. All spills and collected petroleum products will be disposed off in accordance with MoEF&CC and Haryana & Uttar-Pradesh State PCB guidelines.			
Air				
Dust Pollution from Batching Plants	All the plants will be sited at least 1 km in the downwind direction from the nearest human settlement Clearance for siting shall be obtained from the Haryana & Uttar-Pradesh State PCB. Alternatively, only approved plants licensed by the Haryana & Uttar-Pradesh State PCB shall be used. Regular water sprinkling should be provided to ensure the dust suppression. The PM10 value at a distance of 50m from a unit located in a cluster should be less than 100 µg/m3. The monitoring is to be conducted as per the monitoring plan.	Haryana & Uttar-Pradesh State PCB	Contractor	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh.
Emission from	Contractor will ensure that all vehicles, equipment and	Haryana &	Contractor	Environmental

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
Construction Vehicles, Equipment and Machineries	machinery used for construction are regularly maintained and confirm that pollution emission levels comply with the relevant requirements of Haryana & Uttar-Pradesh State PCB. The Environmental Expert of National Highway Division, Haryana will be required to inspect regularly to ensure the compliance of EMP.	Uttar-Pradesh State PCB		Expert of National Highway Division, Haryana & Uttar-Pradesh.
Noise				
Noise from Vehicles, Plants and Equipments	The Contractor will confirm the following: All plants and equipment used in construction shall strictly conform to the MoEF&CC/CPCB noise standards. All vehicles and equipment used in construction will be with exhaust silencers. Servicing of all construction vehicles and	Haryana & Uttar-Pradesh State PCB	Contractor	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh.
	Machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective will be replaced.			

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	Limits for construction equipment used in the project such as compactors, rollers, front loaders, concrete mixers, cranes (moveable), vibrators and saws shall not exceed 75 dB (A) (measured at one meter from the edge of equipment in the free field), as specified in the Environment (Protection) rules, 1986. At the construction sites within 150 m of the nearest habitation, noisy construction work such as, concrete mixing, batching will be stopped during the night times between 10.00 pm to 6.00 am. Contractor will provide appropriate noise barriers to their premises. Noise barrier may be of 2 to 3 m high wall separating the sensitive building from noise or it may a green barrier of vegetation having density of minimum 5 m between sensitive location and the highway monitoring shall be carried out near construction site as per monitoring schedule.			

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh will be required to inspect regularly to ensure the compliance of EMP.			
Safety				
Personal Safety Measures for Labours	Contractor will provide: Protective footwear and protective goggles to all workers employed on mixing asphalt materials, cement, lime mortars, concrete etc. Protective goggles and clothing to workers engaged in stone breaking activities and workers	Office of the Factory Inspector	Contractor	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh.
	Will be seated at sufficiently safe intervals. Earplugs to workers exposed to loud noise, and workers working in crushing, compaction, or concrete mixing operation. The Contractor will not employ any person below the age of 14 years for any work and no woman will be employed on	Office of the Labour Commissioner		

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	the work of painting with products containing lead in any form. The Contractor will also ensure that no paint containing lead or lead products is used except in the form of paste or readymade paint. Contractor will provide facemasks for use to the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.			
Traffic and Safety	The Contractor will take all necessary measures for the safety of traffic during construction and provide, erect and maintain such barricades, including signs, marking, flags, lights and flagmen as may be required by the Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh for the information and protection of traffic approaching or passing through the section of any existing cross roads. Any such activity should be reported to traffic police and a		Contractor	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh.

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	prior consent is taken.			
Precautionary/Safety Measures during Construction	The Contractor will make sure that during the construction work: All relevant provisions of the Factories Act, 1948 and the Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996 will be adhered to.	Building and other Construction Workers	Contractor	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh
	The Contractor will comply with all the precautions as required for the safety of the workmen as per the International Labor Organization. The Contractor will comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress.	(regulation of Employment and Conditions of Services) Act, 1996		
Risk from Electrical Equipment (s)	The Contractor will take adequate precautions to prevent danger from electrical equipment i.e. no material will be so			

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	stacked or placed as to cause danger or inconvenience to any person or the public.			
	All necessary fencing and lights will be provided to protect the public. All machines to be used in the construction will conform to the relevant Indian Standards (IS) codes, will be free from patent defect, will be kept in good working order, will be regularly inspected and properly maintained as per IS provision.	Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996	Contractor	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh.
Risk Force Measure	The Contractor will take all reasonable precaution to prevent danger of the workers and public from fire, flood, etc. The Contractor will keep emergency arrangement so that in case of any mishap all necessary steps can be taken for prompt first aid treatment.	Building and other Construction Workers	Contractor	Environmental Expert of National Highway Division, Haryana &

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
				Uttar-Pradesh.
First Aid	The Contractor will arrange for a readily available first aid unit including an adequate supply of sterilized dressing materials and appliances as per the Factories Rules of Haryana & Uttar-Pradesh at every workplace. Suitable transport to take injured or sick person(s) to the nearest hospital. Equipment and trained nursing staff at every workplace and construction premise.	Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996	Contractor	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh.
Heritage protection and care				
Project area Plantation	The Contractor will do the plantation in their premises as per requirement of the NBCC and Industrial plant's code.	Forest Dept, MoEF&CC	Contractor	Environmental Expert of National Highway Division, Haryana &

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
				Uttar-Pradesh.
Flora/ Fauna	The Contractor will take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora (plant/vegetation) and fauna (animal) including fishing in any water body and hunting of any animal. If any wild animal is found near the construction site at any point of time, the Contractor will immediately upon discovery thereof acquaint the Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh and report to the nearby forest office (forest range office or divisional forest office) and will take appropriate steps/ measures, if required in consultation with the forest officials.	Forest Dept, MoEF&CC	Contractor	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh
Archaeological Property	All fossils, coins, articles of value of antiquity, structures and other remains or things of geological or archaeological interest discovered on the site shall be the property of the	Archaeological survey of India	Contractor	Environmental Expert of National

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	Government, and shall be dealt with as per provisions of the relevant legislation The Ancient Monuments, Archaeological Sites, and Remains Act, 1958.			Highway Division, Haryana & Uttar-Pradesh
Additional Occupational Facility				
Provision of Potable Water	The Contractor will provide, erect and maintain necessary (temporary) living accommodation and ancillary facilities for labour up to standards and scales approved by the National Highway Division, Haryana & Uttar-Pradesh at the location identified for such facilities in pre-construction phase. The Contractor will provide these facilities within the precincts of every	Building and other Construction Workers	Contractor	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh
	Workplace, latrines and urinals in an accessible place, and the accommodation, as per standards set by the Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996. Thc Contractor will construct and maintain all temporary	(Regulation of Employment and Conditions of Services) Act, 1996	-	-

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	accommodation in such a fashion that uncontaminated water is available for drinking, cooking and washing. The Contractor will also guarantee the followings: Supply of sufficient quantity of potable water (as per IS 10500) in every workplace/labour campsite at suitable and easily accessible places and regular maintenance of such facilities. If any water storage tank is provided that will be kept at a distance of not less than 15 m. from any latrine, drain or other source of pollution. If water is drawn from any existing well, which is within close proximity of any latrine, drain or other source of pollution, the well will be disinfected before water is used for drinking. All such wells will be entirely covered and provided with a trap door, which will be dust proof and waterproof. A reliable pump will be fitted to each covered well. The trap			

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	door will be kept locked and opened only for cleaning or inspection, which will be done at least once in a month. Testing of water will be done every month as per parameters prescribed in IS 10500:1991.			
Sanitation and Sewage System	The Contractor will ensure that the sewage system for the camp are designed, built and operated in such a fashion that no health hazards occurs and no pollution to the air, ground water or adjacent water courses take place.	Building and other Construction Workers	Contactor	Environmental Expert of
	Separate latrine and urinals, screened from those from men (and marked in the vernacular) are provided for women Adequate water supply is there to all latrines and urinals All latrines in workplaces are with dry-earth system (receptacles) which are cleaned at least four times daily and at least twice during working hours and kept in a strict sanitary condition Night soil is disposed off by putting layer of it at the bottom of a permanent tank prepared for the purpose and covering	(regulation of Employment and Conditions of Services) Act, 1996		National Highway Division, Haryana & Uttar-Pradesh.

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	it with 15 cm. layer of waste or refuse and then covering it with a layer of earth for a fortnight.			
Waste Disposal	The Contractor will provide garbage bins in the premises and regularly emptied and disposed off in a hygienic manner as per the comprehensive Solid Waste Management plan for the labour/ Contractor's premise approved by the Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh . Contractor will follow all relevant provisions of the Factories Act, 1948 and the Building and the other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 for construction and maintenance of labour camp. The Contractor will make arrangement for disposal of night soil by composting at the workplace unless otherwise arranged by the local sanitary authority. The composting of night soil will be done as per direction of Environmental	Building and other Construction Workers (regulation of Employment and Conditions of Services) Act, 1996	Contractor	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh.

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	Expert of National Highway Division, Haryana & Uttar-Pradesh. The Contractor will also ensure that on completion of the work, all temporary structures are cleared, all rubbish are burnt, night soil or other disposal pits or trenches filled in and effectively sealed off. The site will be left clean and tidy, at the Contractor's expense, to the entire satisfaction to the Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh .			
Monitoring and Community Participation				
Monitoring of Environmental Conditions	The Contractor will undertake seasonal monitoring of air, water, noise, and soil quality through MoEF&CC approved monitoring agency. The parameters to be monitored, frequency and duration of monitoring as well as the locations to be monitored will be as per the monitoring plan Presented in the next section.	MoEF&CC	Contractor	Environmental Expert of National Highway Division, Haryana &

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
				Uttar-Pradesh.
Continuous Community Participation	The Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh will have continuous interactions with local people around the project area to ensure that the construction activities are not causing undue inconvenience to the locals residing in the vicinity of project site under construction due to noise, dust or disposal of debris etc.	National Highway Division, Haryana & Uttar-Pradesh	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh.	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh.
Cleaning of Construction Premises and Restoration	The Contractor will clear all temporary structures, remove or burn all rubbish, and night soils. All disposal pits or trenches will be filled in and effectively sealed off. Residual topsoil, if any will be distributed on adjoining/ proximate barren land or areas identified by Environmental Expert of National Highway Division in a layer of thickness of 75 mm-150 mm.	Dept of Labour, Govt of Haryana & Uttar-Pradesh.	Contractor	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh.
Plantation	Avenue plantation (wherever space is available) will be implemented by Contractor.	Forest Dept,	Contractor	National Highway

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	The plantation will be done as per the plantation scheme prepared for this project. The plantation will be carried by Contractor. Around 10000 trees will be planted along the corridor.			Division, Haryana & Uttar-Pradesh.
OPERATION PHASE				
Monitoring Operation Performance	The National Highway Division, Haryana & Uttar-Pradesh will monitor the operational performance of the various mitigation / enhancement measures carried out as a part of this project. The indicators selected for monitoring include the survival rate of trees, utility of enhancement provision for relocated temples and other important structures, status of rehabilitation of borrow areas and utility of double-glazing for noise sensitive receptors.	National Highway Division, Haryana & Uttar-Pradesh.	Contractor	Environmental Expert of National Highway Division, Haryana & Uttar-Pradesh.
Environmental Compliance Monitoring				
Pollution Monitoring	The periodic monitoring of the ambient air quality, noise level, water (both ground and surface water) quality, soil	Haryana & Uttar-Pradesh	Contractor/ National	National Highway

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	pollution/ contamination in the select location as suggested in pollution monitoring plan in EMP will be responsibility of National Highway Division, Haryana & Uttar-Pradesh. National Highway Division, will appoint CPCB/MoEF&CC approved pollution monitoring agency for this purpose.	State PCB	Highway Division, Haryana & Uttar-Pradesh	Division, Haryana & Uttar-Pradesh
Atmospheric Pollution	Ambient Air concentrations of various pollutants shall be monitored as envisaged in the pollution-monitoring plan.	Haryana & Uttar-Pradesh State PCB	Contractor	National Highway Division, Haryana & Uttar-Pradesh
Ground and Surface Water Analysis	Ground and Surface water has to be analysed as per IS 10500.	Haryana & Uttar-Pradesh State PCB	Contractor	National Highway Division, Haryana & Uttar-Pradesh
Noise Pollution	Noisc pollution will be monitored as per monitoring plan at sensitive locations. Noise control programs to be enforced	Haryana & Uttar-Pradesh	Contractor	National Highway

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
	strictly. Monitoring of the effectiveness of the pollution attenuation barriers, if there is any will be taken up thrice in the operation period.	State PCB		Division, Haryana & Uttar-Pradesh
Waste water management	Provision of Soak pit	Haryana & Uttar-Pradesh State PCB	Contractor	National Highway Division
Municipal Solid waste management	Proper disposal	Haryana & Uttar-Pradesh State PCB	Contractor	National Highway Division, Haryana & Uttar-Pradesh
Hazardous waste management	Proper disposal	Haryana & Uttar-Pradesh State PCB	Contractor	National Highway Division, Haryana & Uttar-Pradesh

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
Changes in Land Use Pattern	National Highway Division, Haryana & Uttar-Pradesh shall take initiative and act as facilitator to prepare an action plan for balanced regional development in consultation with Local Development Authority and State Government to control	District Administration	National Highway Division, Haryana & Uttar-Pradesh & Local	National Highway Division, Haryana & Uttar-Pradesh
	the ribbon development along the project area including new bypasses. A land use regulation control, if applicable need to be adopted. A separate governing body may be formed with the representation of National Highway Division, Haryana & Uttar-Pradesh, Revenue Department and Local Civic Body (Municipal Corporation/ Gram Panchayat) with the power of taking necessary action, if required to remove un-authorized development along the project area. This special body will meet periodically and monitor the development along the project area.		Authorities (Revenue Department and Local Civic Bodies)	

Environmental Issue	Mitigation Measures	Reference and Authority	Implementation	Responsibility
Orientation of Implementing Agency and Contractors	The National Highway Division, Haryana & Uttar-Pradesh shall organize orientation sessions during all stages of the project. The orientation session shall involve all staff of Environmental Cell, field level implementation staff of National Highway Division, Haryana & Uttar-Pradesh, Environmental Expert and Contractor.		Contractor	National Highway Division, Haryana & Uttar-Pradesh

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CHAPTER 10: SUMMARY AND CONCLUSION

10.1 INTRODUCTION

Ministry of Road Transport and Highways, Government of India, has decided to improve the efficiency of freight movement in India. National Highways Authority of India (NHAI) has been entrusted for preparation of DPR to improve the road networks between Haryana and Uttar Pradesh. The proposed access controlled highway project with new alignment has been envisaged through an area that shall have the advantage of simultaneous development as well as shall result in a shorter distance to travel. The junctions with existing road will be planned in the form of interchanges and flyover to ensure uninterrupted flow of traffic.

The proposed road would act as connecting highway between Delhi-Mumbai expressways to Jewar Airport. It will enhance economic development, provide employment opportunities to locals, strengthen tourist development, ensure road safety, and provide better transportation facilities. Vehicle operating cost will also be reduced due to improved road quality. The compensatory plantation and roadside plantation shall further improve the air quality of the region.

10.2 DESCRIPTION OF THE PROJECT

The proposed highway starts from Junction with Ballabhgarh Bypass near village Chandawali CH: 0+000 (District-Faridabad, Haryana) and terminating at Jewar International Airport near Ballabh Nagar Urf Karol Bangar village CH: 31+060 (District- Gautam Buddh Nagar, Uttar Pradesh) passing through districts Faridabad, Palwal & Gautam Buddh Nagar in the state of Haryana & Uttar-Pradesh.

Scope of present report is confined to the (Ch. 0+000 to Ch. 31+060).

The Proposed ROW of this section is taken as 60m in which all the configurations shall be fitted with. This is a green field alignment, and is proposed for 6-Lane. The proposed length of Project Highway is about 31.060 kms.

The road passes through the districts of Faridabad, Palwal & Gautam Buddh Nagar through important villages/towns like Ballabhgarh, Mohna, Palwal, Jewar in the state of Haryana & Uttar-Pradesh.

Table 10.1: Salient features of the project:

S.no.	Parameters/Issues	Description
1.	Length (km)	31.060
2.	Total land acquired (ha)	224.435
3.	Govt. land (ha)	20.435
4.	Pvt. Land (ha)	200
5.	Forest land (ha)	4
6.	Area under protected/ important or sensitive species of flora or fauna/Wildlife Sanctuary	The alignment does not pass through any wild life sanctuary, protected area and its eco sensitive zone.
7.	No. of trees	3000
8.	No. of structure to be impacted due to proposed alignment	57
9.	No. of structure to be constructed	i. Major Bridges (01) ii. Minor Bridges (01) iii. Flyover (01) iv. Vehicular underpass (05) v. LVUP (17) vi. ROB (01) vii. Box Culverts (57)
10.	Total water requirement	9717 KL/day. Water will be extracted from surface sources. The ground water will be abstracted for campsite after obtaining the permission from competent authority.

11.	RoW	60 m as per the requirement keeping in view the fully access controlled Highway with 6-lane dual carriageway configuration.
12.	Construction material	Cement (T)- 664 Coarse Agg. (cum)- 3515 Fine Agg. (cum)- 56066 Steel (ton)- 9469 Bitumen (ton)- 15339 Bitumen Emulsion (ton)- 926
13.	Connectivity	The proposed highway starts from Junction with Ballabhgarh Bypass near village Chandawali(District-Faridabad, Haryana) and terminating at Jewar International Airport near Ballabh Nagar Urf Karol Bangar village (District- Gautam Buddh Nagar, Uttar Pradesh). CH: 0+000 to31+060
14.	Project cost (cr.)	1906

10.3 DESCRIPTION OF THE ENVIRONMENT

The baseline data was generated during Posr-monsoon season of 2021 i.e. Oct to dec 2021. The baseline data has been provided in chapter 3 of this report, which shows the values of almost all of the parameters are well within the prescribed limits.

10.4 ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

- Slight change in the micro-climate of the area is expected due to Heat Island Effect.
- There will be a marginal rise in PM levels during the construction activities, which shall again be within prescribed limit after the construction activities are over.

- The area is likely to experience a marginal increase in noise level due to increase in vehicle density after construction of the road.
- Contamination to water bodies may result due to spilling of construction materials, oil, grease, fuel and paint etc. This will be more prominent in case of locations where the project road crosses rivers, canals, nallahs, etc. Mitigation measures have been planned to avoid contamination of these water bodies.
- Diversion of forest land has been envisaged for this project. Hence, Forest Clearance under the purview of Forest (Conservation) Act, 1980 is required. The application of forest clearance is under process. Adequate compensatory afforestation has been planned as a mitigation measure. The project road doesn't cross any Protected Area. Since the project road is a green field project, acquisition of land shall be required.
- During the construction of the proposed project, the topography may change marginally due to cuts & fills for project road and construction of project related structures etc.
- Provision of construction yard for material handling will also alter the existing topography.

10.5 ANALYSIS OF ALTERNATIVES (TECHNOLOGY & SITE)

Detailed analyses of the alternatives have been conducted taking into account both with and without project. Comparative analysis of all the alternatives has also been conducted. The proposed development of the road is likely to have a positive impact on the economic value of the region. However, there are certain environment and social issues that need to be mitigated for sustainable development.

Three alternatives were studies and the first one was found out to be most suitable.

10.6 ENVIRONMENTAL MONITORING PROGRAM

Regular monitoring of important and crucial environmental parameters is of immense importance to assess the status of environment during operation of the proposed project.

With the knowledge of baseline conditions, the monitoring program can serve as an indicator for any deterioration in environmental conditions due to operation of the project and suitable mitigating steps could be taken in time to safeguard the environment. Monitoring is as important as that of control of pollution since the efficacy of control measures can only be determined by monitoring.

10.7 ADDITIONAL STUDIES

The various additional studies have been undertaken for the project including Public Consultation, Risk assessment and Social Impact Assessment/ R&R Action Plans. Public consultation is a continuous process and has been carried out at all stages throughout the project road. To ascertain the views of the affected families to be recorded and has been included in the Social Impact Assessment report.

10.8 BENEFITS OF THE PROJECT

This project starts from the proposed alignment, starting from Shyamsinghpura and terminating near Bagrana village in the state of Haryana under Bharatmala Pariyojana" by the Government of India. The proposed access controlled project with new alignment has been envisaged through an area which shall have the advantage of simultaneous development as well as shall result in a shorter distance to travel. The junctions with existing road will be planned in the form of interchanges and flyover to ensure uninterrupted flow of traffic.

The proposed road would act as the prime artery for the economic flow to this region. It will Enhance economic development, provide employment opportunities to locals, strengthen tourist development, ensure road safety, and provide better transportation facilities and other facilities such as wayside amenities. Vehicle operating cost will also be reduced due to improved road quality. The compensatory plantation and roadside plantation shall further improve the air quality of the region.

10.9 ENVIRONMENT MANAGEMENT PLAN

Project specific environmental management plan have been prepared for ensuring the implementation of the proposed measures during construction phase of the project, implementation and supervision responsibilities. The cost for environmental management during construction has been indicated in EMP. The project impacts and management plan suggested thereof are summarized in the chapter.

The Environmental Management Plan (EMP) has been designed within the framework of various regulatory requirements on environmental and Socio-economic aspects aiming at the following:

- Minimize disturbance to native flora and fauna, if any.
- Prevent and to attenuate air, water, soil and noise pollution, if any.
- Encourage the socio-economic development.

The environmental management plan (EMP) would, therefore, consists of following main components:

- To integrate potential impacts (positive or negative), environmental mitigation measures, implementation schedule, and monitoring plans.
- To describe the potential environmental impacts and proposed management associated with each stage of the project development.
- To control environmental impacts to levels within acceptable standards, and to minimize possible impact on the community and the workforce of foreseeable risks during the construction and subsequent operational phases of the project.

10.10 CONCLUSION

Based on the EIA study and surveys conducted for the Project, it can be safely concluded that associated potential adverse environmental impacts can be mitigated to an acceptable level by adequate implementation of the measures as stated in the EIA Report. Adequate provisions shall be made in the Project to cover the environmental mitigation and monitoring requirements, and their associated costs as suggested in environmental budget. The proposed project shall improve Road efficiency and bring economic growth. In terms of air and noise quality, the project shall bring considerable improvement to possible exposure levels to population.

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CHAPTER 11: DISCLOSURE OF CONSULTANT

Table 11.1: Contact Details

Name of the Consultant	P and M Solution
Address	C-88, Sector 65, Noida -201301 – U.P
Name of Laboratories	Noida Testing Laboratory
Address	GT-20, Sector 117 Noida

QCI

Quality Council of India

National Accreditation Board for Education & Training

NABET

CERTIFICATE OF ACCREDITATION

P and M Solution

First Floor, C-88, Sector-65, Noida, Uttar Pradesh- 201301

Accredited as Category -A organization under the QCI-NABET Scheme for Accreditation of EIA Consultant Organizations: Version 3 for preparing EIA/EMP reports in the following sectors:

Sl. No	Sector Description	Sector (as per)		Cat.
		NABET	MoEFCC	
1.	Mining of minerals including opencast / underground mining	1	1 (a) (i)	A
2.	River Valley projects	3	1 (c)	B
3.	Metallurgical industries (ferrous & non-ferrous)	8	3 (a)	B
4.	Highways,	34	7 (f)	A
5.	Building and construction projects	38	8 (a)	B
6.	Townships and Area development projects	39	8 (b)	B

***Note:** Names of approved EIA Coordinators and Functional Area Experts are mentioned in IA AC Minutes dated December 20, 2019 on QCI-NABET website.*

The Accreditation shall remain in force subject to continued compliance to the terms and conditions mentioned in NABET's letter of accreditation bearing no. QCI/NABET/ENV/ACO/20/1223 dated February 3, 2020. The accreditation needs to be renewed before the expiry date by P and M Solution, Noida following due process of assessment.

Sr. Director, NABET
Dated: February 3, 2020

Certificate No.
NABET/EIA/1922/IA0053

Valid till
Dec 10, 2022

For the updated List of Accredited EIA Consultant Organizations with approved Sectors please refer to QCI-NABET website.

Figure 11.1: Accreditation Certificate

National Accreditation Board for Testing and Calibration Laboratories

NABL

CERTIFICATE OF ACCREDITATION

NOIDA TESTING LABORATORIES

has been assessed and accredited in accordance with the standard

ISO/IEC 17025:2017

"General Requirements for the Competence of Testing & Calibration Laboratories"

for its facilities at

GT - 20, SECTOR - 117, NOIDA, GAUTAM BUDDH NAGAR, UTTAR PRADESH, INDIA

in the field of

TESTING

Certificate Number: TC-6814

Issue Date: 05/12/2019 Valid Until: 02/12/2021

This certificate remains valid for the Scope of Accreditation as specified in the annexure subject to continued satisfactory compliance to the above standard & the relevant requirements of NABL.
(To see the scope of accreditation of this laboratory, you may also visit NABL website www.nabl-india.org)

Signed for and on behalf of NABL

N. Venkateswaran
Chief Executive Officer

List of Laboratories Accredited in Accordance with the Standard ISO/IEC 17025:2017

S. No.	Name of the Laboratory & Full address	Certificate No	Discipline	Issue Date	Validity date	Validity Extended Upto
822	CLRLaboratories Pvt.Ltd., Chennai, 444, GokulamStreet, Mathur, Near Asis Nagar, Madhavaram, Chennai, Tamil Nadu-600068 Mob: 9841212596 Email: info@glrlabs.com Contact Person: Sh.K.R.Raveenethakrishnan	TC-6251	Biological	03.10.2019	02.10.2021	02.10.2022
822	EASTERN CENTRAL LABORATORY, EASTERN CONDIMENTS PVT. LTD., EASTERN VALLEY Adimaly, Kerala-685561 Mob: 9447435403 Email: parasuramann@eastern.in Contact Person: PARASURAMAN	TC-5995	Biological Chemical	21.07.2019	20.07.2021	20.07.2022
823	Accurate Analyzer Pvt. Ltd., F 20, Ambad MIDC, Nashik, Maharashtra-422010 Mob: 9423175383 Email: qm@accurateenviro.in Contact Person: Sameer Pawar	TC-6604	Chemical	12.03.2020	11.03.2022	11.03.2023
824	ENVIRONMENT TESTING LABORATORY OF RAMANS ENVIRO SERVICES PVT LTD, SF-23 A 34, CAMPS CORNER PRAHLADNAGAR, Ahmedabad, Gujarat-380015 Mob: 9712976724 Email: ramans.consultancy@gmail.com Contact Person: SAMIR C CHOKSI	TC-8091	Chemical	10.01.2019	09.01.2021	09.01.2022
825	Noida Testing Laboratories, GT 20, Sector-117, G. B. Nagar, Noida, Uttar Pradesh 201306 Mob: 09313611642 Email: noida.laboratory@gmail.com Contact Person: Mr. PANKAJ KUMAR SHARMA	TC-6814	Biological Chemical	05.12.2019	02.12.2021	03.12.2022
826	RCA Laboratories, CCA Building, Ilnd Floor, Ward No. 12/B, Plot No. 271, Gandhidham, Gujarat-370201 Mob: 9824751144 Email: narendra@rcalaboratories.com Contact Person: Mr. Narendra Limbachiya	TC-7073	Chemical	25.02.2020	24.02.2022	24.02.2023
827	Materiel Testing Laboratory, 510 Army Base Workshop, 510 Army Base Workshop, Meerut, Meerut, Uttar Pradesh 250001 Mob: 9897301634 Email: udasha.39540@gov.in Contact Person: DINESH KUMAR	TC-5353	Mechanical	16.10.2019	15.10.2021	15.10.2022
828	PAC SHIPPING & ALLIED SERVICES PVT. LTD., FLAT NO.308, 1ST FLOOR, ANKAAR MANSION, VASCO-DA-GAMA, Mormugao, Goa-403802 Mob: 9765167442 Email: goa@paclabs.in Contact Person: BRIAN FARIAS	TC-5541	Chemical	24.04.2019	23.04.2021	23.04.2022
829	R.D.ELECTRO STEEL CO. PVT. LTD., BALTIKURI SURKIMIL, Howrah, West Bengal-711101 Mob: 9163399177 Email: adecwork2012@gmail.com Contact Person: S P DEY	TC-5706	Chemical Mechanical	28.06.2019	27.06.2021	27.06.2022

भारत का राजपत्र

The Gazette of India

असाधारण

EXTRAORDINARY

Figure 11.2: Accreditation Certificate of LAB

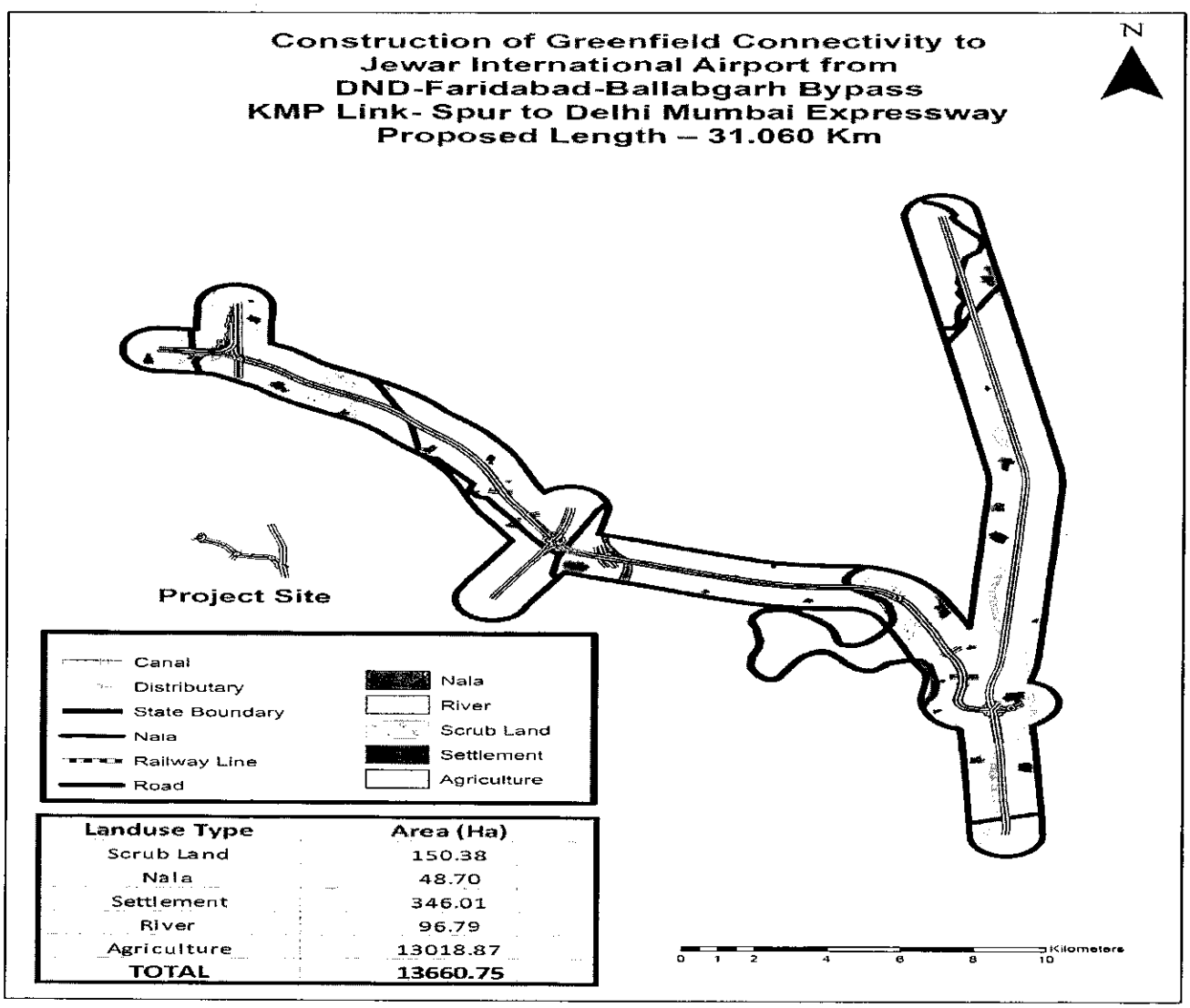
Table 11.2: List of Experts Involved

S.NO.	NAME	EC/FAE	DETAILS	Signature
1	Mr. Mayank Kumar	EC	7(f)	
2	Tapan Majumdar	FAE	HG, GEO	
3	Jatin Kumar Srivastava	FAE	EB, SC,NV	
4	Vikas Chand Tripathi	FAE	RH	
5	Neha Singh	FAE	AP, AQ	
6	Abhay Nath Mishra	FAE	SE	
7	Hussain Ziauddin	FAE	SHW, WP	
8	Poonam Kumari Mangalam	FAE	LU	

****

ANNEXURE A

Land Use Map

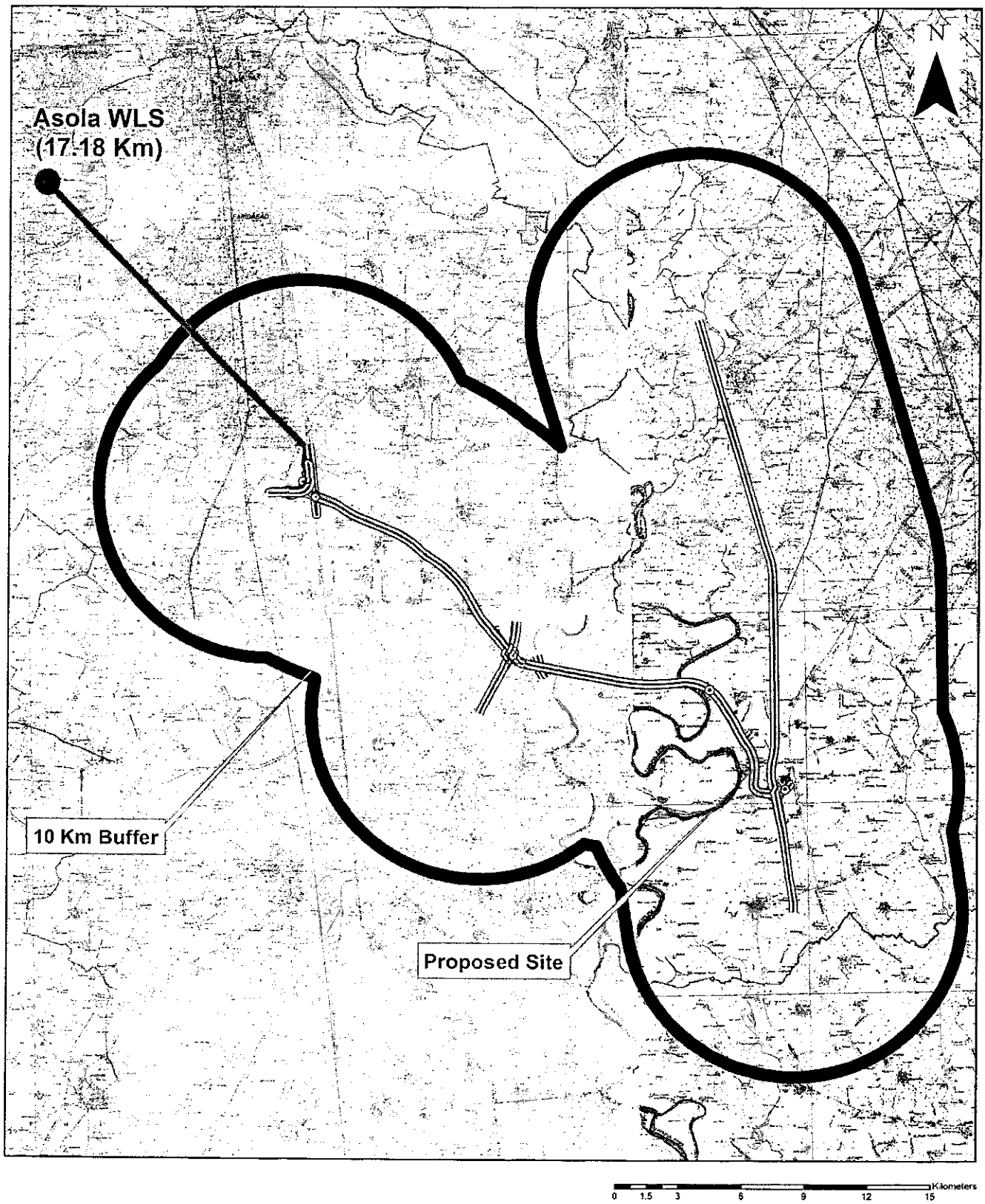


Landuse Type	Area (Ha)
Scrub Land	150.38
Nala	48.70
Settlement	346.01
River	96.79
Agriculture	13018.87
TOTAL	**13660.75**

ANNEXURE B

10 km Buffer Map

Construction of Greenfield Connectivity to Jewar International Airport from DND-Faridabad-Ballabgarh Bypass KMP Link- Spur to Delhi Mumbai Expressway Proposed Length – 31.060 Km



ANNEXURE C

Details of Structures

Details of Vehicular Under Pass

S. No.	Design Chainage (km)	Type of Crossing	Type of Structure	Clear Span/Opening in square direction (m)	Skew angle (degree)	Deck Configuration (m)	Width of Open Median (m)
1	2+513	Local Connectivity Road	PSC I Girder & RCC slab	1x20	45	10.5+10.5+14.5	3.0m (median width varies between two 10.5 m structures)
2	14+331	Local Connectivity Road	PSC I Girder & RCC slab	1x20	25	2x14.5	3.0m
3	19+161	Local Connectivity Road	PSC I Girder & RCC slab	1x20	30	2x14.5	3.0m
4	26+766	Local Connectivity Road	PSC I Girder & RCC slab	1x20	12	2x14.5	3.0m
5	28+248	Local Connectivity Road	PSC I Girder & RCC slab	1x20	16	2x14.5	3.0m
6	30+560	Service road crossing	PSC I Girder & RCC slab	1x30	0	2x18.00	3.0m

Details of Small Vehicular Under Pass

S. No.	Design Chainage (km)	Type of Crossing	Type of Structure	Clear Opening in square direction (m)	Skew angle	Deck Configuration (m)	Width of Open Median (m)
1	3+016	Village Road	RCC Box	1x7.0	30	2x14.5	3.0
2	3+956	Village Road	RCC Box	1x7.0	30	2x14.5	3.0
3	8+648	Village Road	RCC Box	1x7.0	15	2x14.5	3.0
4	23+317	Village Road	RCC Box	1x7.0	15	2x14.5	3.0

Details of Fly-Over

S. No.	Design Chainage (Km)	Intersecting Road	Type of Structure	Span Arrangement c/c Expansion joint in Square direction (m)/Clear opening in Square direction	Skew angle (degree)	Deck Configuration (m)	Width of Open Median (m)	Minimum Vertical Clearance (m)
1	3+660	Sector road	PSC I Girder & RCC slab	2x30	30	2x14.5	3.0m	5.5m
2	6+850	Sector road	PSC I Girder & RCC slab	2x30	0	2x14.5	3.0m	5.5m
3	8+250	Sector road	PSC I Girder & RCC slab	2x30	0	2x14.5	3.0m	5.5m
4	9+530	Sector road	PSC I Girder & RCC slab	2x30	0	2x14.5	3.0m	5.5m
5	13+983	Eastern Peripheral Expressway	PSC & Steel composite Girder & RCC slab	1x30+2x50+1x30	30	2x18.00	3.0m	5.5m
6	23+804	ODR	PSC I Girder & RCC slab	3x30	0	2x14.5	3.0m	5.5m
7	24+700	Sector road	PSC I Girder & RCC slab	2x25	0	2x14.5	3.0m	5.5m
8	29+300	Sector road	PSC I Girder & RCC slab	2x25	0	2x14.5	3.0m	5.5m
9	30+226	Yamuna Expressway	PSC & Steel composite Girder & RCC slab	1x30+2x50+1x30	05	2x21.25	3.0m	5.5m

Details of Culverts

S.No	Design Chainage	Type Of Culvert	Size
			No x Width (m) x Height (m)
1	2+203	Box Culvert	1x4x4
2	2+659	Box Culvert	1x4x4
3	3+440	Box Culvert	1x4x4
4	4+565	Box Culvert	1x4x4
5	4+830	Box Culvert	1x4x4
6	5+680	Box Culvert	1x4x4
7	6+030	Box Culvert	1x3x3
8	6+670	Box Culvert	1x4x4
9	7+480	Box Culvert	1x4x4
10	7+709	Box Culvert	1x4x4
11	8+035	Box Culvert	1x4x4
12	8+400	Box Culvert	1x4x4
13	8+900	Box Culvert	1x4x4
14	9+240	Box Culvert	1x4x4
15	9+745	Box Culvert	1x4x4
16	9+980	Box Culvert	1x4x4
17	11+064	Box Culvert	1x3x3
18	11+466	Box Culvert	1x6x4
19	11+735	Box Culvert	1x4x4
20	12+035	Box Culvert	1x3x3
21	12+411	Box Culvert	1x4x4
22	12+933	Box Culvert	1x4x4
23	13+143	Box Culvert	1x3x3
24	13+426	Box Culvert	1x4x4
25	14+566	Box Culvert	1x6x4
26	16+038	Box Culvert	1x6x4
27	16+300	Box Culvert	1x4x4
28	16+509	Box Culvert	1x3x3
29	16+965	Box Culvert	1x3x3
30	17+200	Box Culvert	1x3x3
31	17+489	Box Culvert	1x6x4
32	17+646	Box Culvert	1x3x3
33	17+870	Box Culvert	1x4x4
34	18+046	Box Culvert	1x3x3
35	18+400	Box Culvert	1x3x3
36	18+585	Box Culvert	1x4x4
37	18+866	Box Culvert	1x3x3
38	19+320	Box Culvert	1x4x4

S.No	Design Chainage	Type Of Culvert	Size
			No x Width (m) x Height (m)
39	19+510	Box Culvert	1x3x3
40	19+724	Box Culvert	1x4x4
41	20+220	Box Culvert	1x3x3
42	20+370	Box Culvert	1x4x4
43	20+646	Box Culvert	1x3x3
44	20+930	Box Culvert	1x4x4
45	21+420	Box Culvert	1x4x4
46	21+650	Box Culvert	1x3x3
47	22+560	Box Culvert	1x3x3
48	23+460	Box Culvert	1x3x3
49	24+100	Box Culvert	1x4x4
50	24+950	Box Culvert	1x4x4
51	25+330	Box Culvert	1x4x4
52	25+560	Box Culvert	1x4x4
53	26+280	Box Culvert	1x3x3
54	27+106	Box Culvert	1x3x3
55	27+450	Box Culvert	1x4x4
56	27+786	Box Culvert	1x3x3
57	28+706	Box Culvert	1x4x4
58	29+086	Box Culvert	1x3x3
59	29+560	Box Culvert	1x4x4
60	30+906	Box Culvert	1x3x3

ANNEXURE D

Details of Proposed Bridges

Details of Major Bridges (over River stream and nallas)

Sl. No.	Design Chainage (Km)	Name (River/Streams/Nalla)	Span Arrangement c/c Expansion joint in Square direction (m)	Skew angle (degree)	Structure Type	Deck Configuration (m)	Width of Open Median (m)
1	15+571	Yamuna River	12X60	0	Segmental Box Girder	2x14.5	3.0

Details of Minor Bridge (over River stream and nallas)

Sl. No.	Design Chainage (Km)	Span Arrangement c/c Expansion joint (m)	Type of Structure	Deck Configuration (m)	Width of Open Median (m)	Remarks
1	22+220	1x25	PSC I Girder+RCC Slab	2x14.5	3.0m	

Details of Minor Bridge (over Irrigation canals)

Sl. No.	Design Chainage (Km)	Span Arrangement c/c Expansion joint in Skew direction (m)	Skew Angle (Degree)	Type of Structure	Deck Configuration (m)	Width of Open Median (m)	Remarks
1	27+923	1X25	08	PSC I Girder+ RCC Slab	2x14.5	3.0m	

1818305/2022/REGION BALLABGARH

Gmail

Ballabhgarh Region HSPCB <hspcbrobr@gmail.com>

Fw: Public hearing for Environment Clearance

2 messages

Mon, Mar 14, 2022 at 4:21 PM

PIU Mathura <mat@nhai.org>
To: "hspcbrobr@gmail.com" <hspcbrobr@gmail.com>

महोदय/Sir,

PFA

भवदीय/Regards,

परियोजना निदेशक / Project Director,
गलियारा प्रबन्धन ईकाई / Corridor Management Unit
भारतीय राष्ट्रीय राजमार्ग प्राधिकरण / National Highways Authority of India
प्लाट न. 8, निकट सराय टोल प्लाजा भवन, फरीदाबाद-१२१००3 /Plot No.8, Near Sarai Toll Plaza Building, Faridabad-121003

From: PIU Mathura
Sent: Wednesday, March 9, 2022 1:42 PM
To: dcfbd@hry.nic.in
Cc: info@sainfra.com; hspcbrojr@gmail.com
Subject: Public hearing for Environment Clearance

महोदय/Sir,

Please Find Attachment on the subject matter.

भवदीय/Regards,

परियोजना निदेशक / Project Director,
गलियारा प्रबन्धन ईकाई / Corridor Management Unit
भारतीय राष्ट्रीय राजमार्ग प्राधिकरण / National Highways Authority of India
प्लाट न. 8, निकट सराय टोल प्लाजा भवन, फरीदाबाद-१२१००3 /Plot No.8, Near Sarai Toll Plaza Building, Faridabad-121003

65431.pdf
1320K

Mon, Mar 14, 2022 at 4:28 PM

PIU Mathura <mat@nhai.org>
To: "hspcbrobr@gmail.com" <hspcbrobr@gmail.com>

2070062/2022/Estt Br
4818305/2022/REGION BALLABGARH

महोदय/Sir,

Please find the attached letter and kindly mention the name of venue as intimated by our DPR Consultant as follows:

"Agriculture Market Complex Mohna, Landmark Infront of Mohna Tehsil, District Faridabad"

भवदीय/Regards,

परियोजना निदेशक / Project Director,
गलियारा प्रबन्धन ईकाई / Corridor Management Unit
भारतीय राष्ट्रीय राजमार्ग प्राधिकरण / National Highways Authority of India
प्लाट न. 8, निकट सराय टोल प्लाजा भवन, फरीदाबाद-१२१००3 /Plot No.8, Near Sarai Toll Plaza Building, Faridabad-121003

From: PIU Mathura
Sent: Monday, March 14, 2022 4:21 PM
To: hspcbrobr@gmail.com
Subject: Fw: Public hearing for Environment Clearance

[Quoted text hidden]

65431.pdf
1320K